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VOLUME II NUMBER 13

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NEW YORK STATE COLLEGE OF AGRICULTURE

ANNOUNCEMENT OF THE FIRST SUMMER SCHOOL IN AGRICULTURE

JULY 6--AUGUST 16

1911

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NEW YORK STATE COLLEGE OF AGRICULTURE

ANNOUNCEMENT OF THE FIRST SUMMER SCHOOL IN AGRICULTURE

JULY 6--AUGUST 16
1911

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JULY 1, 1911
PUBLISHED BY CORNELL UNIVERSITY
ITHACA, NEW YORK

CALENDAR

In order to secure the full number of exercises announced for the session, it is necessary that all work begin promptly on Thursday morning, July 6. Students are therefore urged to reach Ithaca in time to be present at the first exercise in each class. If possible, they should register on Wednesday; if not, they should register on Thursday during the hours not occupied in class work.

July 5, Wednesday, 9 a. m. to 5 p. m.—Registration first at Office of Registrar, Morrill Hall, and then with the Secretary, College of Agriculture, Main Building, Room 122.

July 6, Thursday.—Instruction begins at times and places announced under each course. Registration continued.

July 6, Thursday, 8 p. m., and following Thursdays.—Musical Recital, Sage Chapel.

July 7, Friday, 8 p. m.—General Assembly of all summer students, addressed by Dean L. H. Bailey. Barnes Hall.

July 10, Monday, 8 p. m.—First Lecture in Monday evening course in regular University Summer Session. Continued on following Mondays. Rockefeller Hall.

July 11, Tuesday, before 5 p. m.—Last day for the payment of tuition fees at the Treasurer's Office, 1 Morrill Hall.

July 11, Tuesday, 8 p. m., and following Tuesdays.—Musical Recital, Sage Chapel.

July 12, Wednesday, 7.30 p. m., and following Wednesdays.—General lecture and conference on agricultural topics. College of Agriculture, Main 292.

August 15, 16, Tuesday and Wednesday.—New York State Examinations for Teachers' Certificates.

It is expected that a special training conference for rural leaders, to continue for one or two weeks, will be held at the College of Agriculture some time during the Summer School. After June 1st, definite information may be had on application to the Secretary, College of Agriculture.

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CORNELL UNIVERSITY, SUMMER SCHOOL IN AGRICULTURE, 1911

OFFICERS

Jacob Gould Schurman, LL.D., President of the University.
Liberty Hyde Bailey, LL.D., Director of the College of Agriculture
David Fletcher Hoy, M.S., Registrar of the University.
Albert Russell Mann, B.S.A., Secretary to the College of Agriculture.

FACULTY

The members of the faculty are, except when the contrary is indicated, regular members of the Cornell University staff of instruction.

Henry Hiram Wing, M.S. in Agr., Professor of Animal Husbandry.
John Lemuel Stone, B.Agr., Professor of Farm Practice.
James Edward Rice, B.S.A., Professor of Poultry Husbandry.
George Walter Cavanaugh, B.S., Professor of Chemistry in its Relations with Agriculture.
Elmer Otterbein Fippin, B.S.A., Professor of Soil Technology.
George Frederick Warren, Ph.D., Professor of Farm Management and Farm Crops.
Charles Scoon Wilson, A.B., M.S.A., Professor of Pomology.
Wilford Murray Wilson, M.D., Professor of Meteorology (detailed by Weather Bureau, United States Department of Agriculture).
Layton S. Hawkins, A.M., Head of Department of Science, State Normal School, Cortland.
Merritt Wesley Harper, M.S., Assistant Professor of Animal Husbandry.
Clarence Arthur Rogers, M.S.A., Assistant Professor of Poultry Husbandry.
Paul J. White, A.B., M.S.A., Ph.D., Assistant Professor of Farm Crops.
Glenn Washington Herrick, B.S.A., Assistant Professor of Economic Entomology.
Harold Ellis Ross, B.S.A., M.S.A., Assistant Professor of Dairy Industry.
Elmer Seth Savage, B. S. A., M. S. A., Assistant Professor of Animal Husbandry.
Lewis Josephus Cross, B.A., Instructor in Agricultural Chemistry.
Roy David Anthony, B.S. in Agr., Instructor in Pomology.
Mortier Franklin Barrus, A.B., Instructor in Plant Pathology.
Alice Gertrude McCloskey, A.B., Lecturer in Nature-Study.
Flora Rose, B.S., M.A., Lecturer in Home Economics.
Martha Van Rensselaer, A.B., Lecturer in Home Economics.
Anna Botsford Comstock, B.S., Lecturer in Nature-Study.
Harry O. Buckman, M. S. A., Assistant in Soil Technology.
Ray Eugene Deuel, B.S. in Agr., Assistant in Animal Husbandry.
Earl Whitney Benjamin, Assistant in Poultry Husbandry.
Charles Edward Hunn, Gardener.

OBJECT OF THE SUMMER SCHOOL IN AGRICULTURE

The object of the Summer School in Agriculture is to train persons who desire to teach agriculture, including nature-study and home economics. The courses are open not only to teachers but also to other qualified persons who may wish to avail themselves of the opportunities offered.

Instruction is given in three groups of courses, in any one of which a person may spend all his time. Opportunity is provided for persons taking one of the groups to elect some work in one of the other groups.

1. **Agriculture.** In this group, instruction is offered in soils, agricultural chemistry, farm crops, animal husbandry, dairy industry, poultry husbandry, pomology, farm management, entomology, plant pathology, and meteorology.

2. **Nature-Study and Elementary Agriculture.** The subjects included in this group are the history development, and pedagogics of the nature-study idea; school gardens; field trips; collection, preparation, and preservation of materials; rural education; nature literature; and specific lessons in elementary agriculture and nature-study as outlined in the syllabus issued by the New York State Department of Education for 1911–12.

3. **Home Economics.** This group covers the general subjects of foods, human nutrition, principles of household economy, and household sanitation.

The Summer School in Agriculture is distinct from the regular Summer Session in Cornell University. Any of the courses in the regular University Summer Session, however, may be elected by qualified students registered in the Summer School in Agriculture. For a course thus elected by residents of New York State, a fee of $15 will be charged; for two or more courses, a fee of $25 will be charged. Announcements of the University Summer Session may be had on application to the Registrar, Cornell University.

ADMISSION, ATTENDANCE, REGISTRATION

There is no examination for admission to the Summer School in Agriculture. Each person, however, must satisfy the instructor in charge of any course that he is qualified to pursue the work of the course. Any duly registered student in the Summer School in Agriculture may visit other classes than those for which he is specifically registered.

All students are required to register first at the office of the University Registrar in Morrill Hall. They may register on Wednesday, July 5, between 9 a. m. and 5 p. m., or on the day of their arrival, if they reach Ithaca later than July 5. Registration on July 5 is urged. No registration later than July 12 will be permitted. Class exercises begin at 8 a. m. Thursday, July 6. The Registrar's office is open from 9 a. m. to 4 p. m., every day, except Saturday, when it is closed at noon. Students will report at the office of the Secretary, College of Agriculture, room 122, Main Building, immediately after registering with the Registrar of the University.

TUITION FEE

Tuition in the Summer School in Agriculture is free to residents of New York State. Non-residents will be charged a tuition fee of $25, whether one subject or more be taken. This must be paid at the office of the Treasurer, Room 1, Morrill Hall, within five days after registration day. In case of withdrawal, for reasons satisfactory to the Treasurer and the Registrar, within five days from the first registration day, the tuition may be refunded and the charge cancelled. In case of withdrawal within two weeks of the first registration day, one-half the tuition paid may be refunded.

LABORATORY FEES

Fees to cover the cost of materials used will be charged as follows: poultry husbandry, $1.00; plant diseases, $.75; insects, $.50; home economics A, $4; home economics B, $3. Fee cards will be secured at the first class-period in each of the courses concerned. The receipted fee cards must be returned to the instructor in charge of the course within two days after the beginning of the course.

ACADEMIC CREDIT FOR WORK

Academic credit will be allowed for the work in nature-study and home economics as announced in connection with those courses. On the completion of the agriculture group, one unit in entrance agriculture will be given to those persons who pass an examination for that purpose at the close of the Summer School.

Certificates for Work. Students in the Summer School who are not matriculated in the University may receive certificates of attendance and of work satisfactorily performed. Application for them must be made before August 16, and the applicant must leave at the office of the Registrar a large sized envelope stamped and directed to his home address. The certificate will then be forwarded by mail.

COST OF LIVING

The cost of board and furnished room in Ithaca during the Summer School runs from $5.50 a week upwards. In some cases the cost has been reduced to $5, or even to $4.50, but it is not safe to count on less than $5.

The price of a single furnished room may be as low as $1 a week. The prices advance with the size and location of the rooms.

The price of table board runs from $4 and $4.50 in boarding houses, to $7 and $10 at the hotels. Living at hotels costs from $10.50 up.

The University has one residence hall, Sage College, with an annex, Sage Cottage. This will be open for women throughout the Summer School. Married men accompanied by their wives may be lodged in Sage Cottage, where the first and second floors will be reserved for them. As the great majority of the persons living in these buildings are attending the University for serious work, it is necessary that the rooms and halls should be quiet during the hours of rest. Persons unwilling to conform to reasonable regulations for securing this quiet are not wanted in the buildings. The price of rooms in Sage College is from $1.25 to $5.50 a week, according to location, and of table board $5.00. The capacity of the building is usually engaged in advance, and early application is therefore advisable.

Application should be made to the Manager of Sage College, Ithaca, N. Y. Every application for a room to be reserved must be accompanied by a deposit of $5, otherwise the application is not registered. The amount of this deposit is deducted from the rent if the room assigned be occupied by the applicant; it is refunded if the applicant gives formal notice to the manager on or before June 15th, that she desires to withdraw the application.

Without permission from the Director of the University Summer Session, no one will be allowed to room in Sage College or Sage Cottage during the summer unless registered in the University Summer Session or in the Summer School in Agriculture.

The whole expense of attendance at the Summer School, not including laboratory fees, may be estimated at $65 to $85.

THE LIBRARIES

The University Library is open on week days from 9 a. m. to 5 p. m., except Saturday, when it closes at 1 p. m. In this are housed the main library, containing about three hundred and ninety thousand volumes, and most of the seminary and special libraries. The main reading room affords accommodations for over two hundred readers, and contains a selected library of over 8,000 volumes of reference works. Adjacent to it is the periodical room in which are kept the current numbers of about five hundred journals in various fields of knowledge. These rooms are open to all students. Students properly qualified are allowed the use of the seminary rooms and of the books in them. The main collection is primarily a library of reference for use in the building. Students are, however, allowed to a limited extent to take out books for home use. Persons wishing this privilege must make a deposit of $5, which will be refunded upon the return of all books taken out.

The library of the College of Agriculture, on the first floor of the main building, is open on week days from 9 a. m. to 5 p. m., except Saturday, when it closes at 1 p. m. In it will be found a large collection of bulletins and reports of experiment stations, reference books on agriculture and country life, agricultural periodicals, and the like.

LECTURES, MUSICAL RECITALS, EXCURSIONS

In addition to the regular class-room work, there will be lectures before the University Summer Session on topics of general interest on Monday evenings throughout the Session. The lectures are open to students in the Summer School in Agriculture. On Wednesday evening of each week throughout the School, a special lecture on an agricultural or country life subject of general interest will be given in the main building of the College of Agriculture, Room 292, at 7.30 o'clock. It will be followed at 8.30 by an informal conference.

Musical recitals will be given on Tuesday and Thursday evenings in the Sage Chapel.

Occasional special excursions will be arranged, announcement of which will be made from week to week.

RAILROAD ROUTES AND RATES

Ithaca is reached by either the Lehigh Valley or the Lackawanna railroad. By the latter, a branch leaves the main line at Owego. Through trains run from New York and Buffalo on the Lehigh and through sleeping cars run daily from New York on both roads. From Philadelphia, Baltimore, Washington, and the South, via the Baltimore & Ohio, the Philadelphia & Reading connects with the Lehigh at Bethlehem. On the Lehigh, through trains for Ithaca connect with the New York Central at Auburn and Canastota, and with the Pennsylvania (Northern Central) and the Erie at Elmira.

From points in Trunk Line and New England Passenger Association territory (east of Pittsburg and Buffalo and north of Washington, D. C.), a special railroad rate of a fare and three-fifths will be granted to students of the Summer School. This reduction can be obtained only by application for the proper certificate (not receipt), when buying a ticket to Ithaca, and upon condition that at least one hundred certificates are presented to the Registrar at Ithaca. The University can not guaranteé the reduction to any one. In previous years, however, the condition always has been met in the University Summer Session, and the reduced fare obtained by holders of certificates.

To secure the reduced rate for the return journey, it is necessary to buy a regular ticket from the starting point to Ithaca, not earlier than July 2nd nor later than July 8th. When purchasing the ticket, ask for a certificate, not a receipt. Persons starting from a point outside the territory within which the reduced rate is granted, may buy a ticket to some point in this territory and then secure a ticket to Ithaca, getting the proper certificate. It is best to find out about this matter a week or so before the time when it is intended to start.

If the full number of certificates is presented to the Registrar at Ithaca, students will then be entitled, upon payment of twenty-five cents, to receive an order entitling them to return tickets to the point of starting, for three-fifths of the fare paid in coming to Ithaca. This privilege begins August 13th and expires August 19th. Holders of certificates should present them when they register at the University.

For further information, and for directions as to form of application, apply to the Registrar, Cornell University, or to railroad agent at home office.

COURSES OF INSTRUCTION

The courses of instruction are announced in three distinct groups or schools, namely, agriculture, nature-study, and elementary agriculture, and home economics. Persons in the Summer School may specialize in any one of these groups, or may elect such courses from any of them as they may be able to schedule and are qualified to pursue. Ordinarily it will be advantageous to confine one's attention chiefly to the subjects in one of the groups, and return another summer if instruction in a second group is desired.

GROUP I. AGRICULTURE

Each of the following courses continues for but a short period, as is indicated in the announcement of the course. These courses have been scheduled in such a way as to make a consecutive program.

Soils. Lectures, daily at 8, Main Building 292. Laboratory, M T Th F, 2–4.30, W S, 10–12.30, Agronomy Building 42. July 6–12. Professor Fippin and Mr. Buckman.

A discussion of the character and handling of soils. The following are the topics of the lectures to be given. (1) The formation, classification, and distribution of soils. (2) Physical properties of soil. (3) Soil moisture and its regulation, including drainage and the mulch. (4) Soil amendments, including lime, organic matter, and organisms. (5) Fertilizers and manures. (6) Cultural practice, including tillage, crop adaptation, and crop rotation. The laboratory work, consisting of field excursions and indoor exercises, will deal with important phases of these discussions.

Agricultural Chemistry. Lectures, daily at 8, Morse 1. Laboratory, M T Th F, 2–4.30, Morse 1. July 13–19. Professor CAVANAUGH and Mr. CROSS.

A discussion of the relations of chemistry to agriculture, including the sources of fertilizing materials, their preparation for use, and a study of the various forms of lime.

Cows. Lectures, daily at 9, Animal Husbandry Lecture Room. Practice, M T Th F, 10–12.30, Judging Pavilion. July 6–12. Professor WING, Assistant Professor SAVAGE, and Mr. DEUEL.

A discussion of the principles of feeding dairy cattle, the principles of breeding animals, and the historical development of the leading breeds of dairy cattle.

Milk. Lectures, daily at 9, Dairy Building 222. Laboratory, daily at 10–12.30, Dairy Building 232. July 13–15. Assistant Professor Ross and Mr. ———.

A discussion of the constituents of milk and their interrelations; the Babcock test for butter-fat; the lactometer and its use in detecting adulterations. The laboratory work covers the methods outlined in the lectures.

Horses. Lectures, daily at 9, Animal Husbandry Lecture Room. Practice daily except S, 10–12.30, Judging Pavilion. July 17–22. Assistant Professor HARPER and Mr. DEUEL.

A discussion of the principles of breeding, judging, and training of horses, with an historical discussion of the more important breeds.

Poultry Husbandry. Lectures, daily at 9, Dairy Building, 222. Laboratory daily except S, 10–12.30, Main 202. July 24–29. Professor RICE, Assistant Professor ROGERS, and Mr. BENJAMIN.

The subjects discussed in the lectures are: (1) feeding for egg production and fattening; (2) incubating and brooding; (3) feeding chickens; (4) breeding; (5) the breeds; (6) poultry-house construction. The laboratory exercises include: (1) study of poultry; (2) study of the egg; (3) mixing rations and study of feeds; (4) grading eggs; (5) study of the breeds. Laboratory fee, $1.00.

Farm Crops. Lectures, daily at 8, Main Building 292. Laboratory, M T Th F, 2–4.30, S, 10–12.30, Agronomy Laboratory 202. July 20–August 2. Dr. WHITE and Professor STONE.

A discussion of corn, weeds, potatoes, clover, alfalfa, timothy, and pastures.

Pomology. Lectures, daily at 9, Dairy Building, 222. Laboratory, daily at 10–12.30, Main 202. July 31–August 5. Professor C. S. WILSON and Mr. ANTHONY.

A discussion of the methods of propagating the fruits, and the principles of budding and grafting; the practice of planting, spraying, and pruning fruit trees; the varieties, the exhibition, and the packing of fruits.

Insects. Lectures, daily at 8, Main Building 292. Laboratory, M T Th F, 2–4.30, Main 392. August 3–9. Assistant Professor HERRICK.

A discussion of the structure and characteristics of insects, with a brief consideration of the life-history and habits of some of the more commonly injurious forms, together with the most approved methods of combating them. In the laboratory and field, an opportunity will be given to become acquainted with the injuries and habits of the insects. Laboratory fee, $.50.

Plant Diseases. Lectures, daily at 8, Main Building 292. Laboratory, M T Th F, 2–4.30, Agronomy Building 302. August 10–16. Mr. BARRUS and Mr. ———.

The lectures will discuss potato blights, potato scab, peach leaf curl, apple scab, and corn smut, with practical means of control. In the laboratory the life history of the causal organism will be studied with the microscope. Its effect upon the host will be carefully noted by examination of specimens. The relation of the control of the disease to the life history of the causal organism will be explained. Laboratory fee, $.75.

Farm Management. Lectures, daily at 9, Dairy Building 222. Laboratory, M T W, 10–12.30, Agronomy Building 202. August 7–9 and 14–16. Professor WARREN.

Discussions and laboratory work on cropping systems, types of farming, farm accounts, and organization and management of some successful farms.

Weather. Lectures, daily at 9, Dairy Building, 222. Laboratory and conference, daily at 10–12.30, Dairy Building 222. August 10–12. Professor W. M. WILSON.

This course offers suggestions as to subjects for meteorological study that come within the scope of the facilities afforded by the public schools; where and how data may be obtained for school use; the construction and interpretation of weather maps and climatological charts; weather forecasting from weather maps and from local observations; use and care of meteorological instruments; the general principles of the circulation of the atmosphere; the development, progression, and conditions that attend cyclones, hurricanes, and special storms; cloud studies, air drainage, frost, and methods of protection. Special attention is given to the work of the U. S. Weather Bureau in cooperation with the public schools.

SUMMER SCHOOL IN AGRICULTURE

1911

Tabular Schedule of Subjects and dates in Group 1, Agriculture

July	8–9	9–10	10–12.30	2–4.30
6	Soils	Cows	Cows	Soils
7	Soils	Cows	Cows	Soils
8	Soils	Cows	Soils	X
10	Soils	Cows	Cows	Soils
11	Soils	Cows	Cows	Soils
12	Soils	Cows	Soils	X
13	Agr. Chem.	Milk	Milk	Agr. Chem.
14	Agr. Chem.	Milk	Milk	Agr. Chem.
15	Agr. Chem.	Milk	Milk	X
17	Agr. Chem.	Horses	Horses	Agr. Chem.
18	Agr. Chem.	Horses	Horses	Agr. Chem.
19	Agr. Chem.	Horses	Horses	X
20	Corn	Horses	Horses	Corn
21	Corn	Horses	Horses	Corn
22	Weeds	Horses	Weeds	X
24	Weeds	Poultry Hus.	Poultry Hus.	Weeds
25	Potatoes	Poultry Hus.	Poultry Hus.	Potatoes
26	Potatoes	Poultry Hus.	Poultry Hus.	X
27	Clover	Poultry Hus.	Poultry Hus.	Clover
28	Clover	Poultry Hus.	Poultry Hus.	Clover
29	Alfalfa	Poultry Hus.	Alfalfa	X
31	Timothy	Pomology	Pomology	Pastures
Aug.				
1	Pastures	Pomology	Pomology	Pastures
2	Pastures	Pomology	Pomology	X
3	Insects	Pomology	Pomology	Insects
4	Insects	Pomology	Pomology	Insects
5	Insects	Pomology	Pomology	X
7	Insects	Farm Man.	Farm Man.	Insects
8	Insects	Farm Man.	Farm Man.	Insects
9	Insects	Farm Man.	Farm Man.	X
10	Plant Diseases	Weather	Weather	Plant Diseases
11	Plant Diseases	Weather	Weather	Plant Diseases
12	Plant Diseases	Weather	Weather	X
14	Plant Diseases	Farm Man.	Farm Man.	Plant Diseases
15	Plant Diseases	Farm Man.	Farm Man.	Plant Diseases
16	Plant Diseases	Farm Man.	Farm Man.	X

The afternoons indicated by X are Wednesday and Saturday, and are left vacant for the students personal use.

GROUP II. NATURE-STUDY AND ELEMENTARY AGRICULTURE

Each of the following courses continues throughout the six weeks of the Summer School.

A. **The Nature-Study Idea.** Lectures, M W F, 11, Main 392. Professor Hawkins and Mrs. Comstock.

Lectures on the history and development of the nature-study idea; its educational importance; its pedagogics; arrangement of courses of study; the field trip; the school-garden; the procuring and using of material; the literature of the subject; other topics of fundamental importance. Special attention will be given to the course of study outlined in the New York State Syllabus of 1910. In connection with this course, opportunity will be given to prepare the material and literature of one or more special topics.

B. **Nature-Study Material.** Field and laboratory work, M W F, 2–5, Main 302. Professor Hawkins and Mrs. Comstock.

Some of the topics forming the basis of the work are study of natural objects in the field; collection of material; preparation and preservation of materials; equipping and maintaining aquaria, vivaria, terraria, etc.; organizing and maintaining school museums; outlining and conducting field and laboratory lessons. Special attention will be given to the type studies for 1911 in the New York State Syllabus of 1910. While this course is planned especially to aid teachers and supervisors, it will also be of value to any others interested in outdoor study. The greater part of each exercise will be held in the field.

Opportunity will be provided for persons who desire to secure practical work in the making of school-gardens. Mr. Hunn.

Nature-study students will unite with the botany students in three all-day excursions on Saturday. (See under announcement of botany in University Summer Session, page 41).

Students who satisfactorily complete courses A and B and participate in at least two of the three Saturday excursions, will receive three hours' credit.

C. **Rural Education.** Lectures and conferences, T Th, 11, Main 392. Professor Hawkins and others.

This course will consider rural school conditions; the field of agriculture in education; the relations of school and community; teachers' institutes; farmers' institutes; extension work; the relations of rural schools; and other topics of importance in rural education. Various instructors in touch with rural school problems will assist in this course.

D. **Elementary Agriculture and Nature-Study.** Lectures and conferences. T Th, 2–5, Rural School House. Miss McCloskey.

Specific lessons in elementary agriculture and nature-study as outlined in the New York State Syllabus for 1911–12 will be taken up in this course. The lessons will be given by the persons preparing subject matter for the Rural School Leaflets of next year. Methods of conducting lessons will be discussed. Text covering subject matter for the complete year's work, as outlined by the Syllabus, will be placed in the hands of teachers and school commissioners before the close of the Summer School. Simple apparatus suitable for use in rural schools will be considered. One lecture will be given on books.

E. **Nature Literature.** Lectures and readings, T Th, 10, Main 392. Mrs. Comstock, and one reading by Director Bailey.

This course will include a study of the modern nature stories with reference to their relative value for children; a discussion of the writers of nature classics, as Isaak Walton, White of Selborne, Thoreau, and others; a special consideration of nature poetry.

GROUP III. HOME ECONOMICS

Each of the following courses continues throughout the six weeks of the Summer School. All work is given on the third floor of the main building of the College of Agriculture.

A. **Foods.** Lectures and recitations, M W F, 10. Laboratory, M W F, 11–2. Credit, two hours. Miss Rose.

A course for establishing a fundamental knowledge of foods. The lectures will include a discussion of the sources, composition, and characteristics of food-stuffs; principles governing the selection of foods and methods of preparing them; food preservation; comparative nutritive value and cost of various foods; selection, planning, and serving of well-balanced meals. The laboratory work will follow the lectures closely and will consist of experiments in determining the characteristics of food-stuffs as these relate to the preparation of food and to practical problems of cookery. Laboratory fee, $4.00.

B. **Human Nutrition.** Lectures and recitations, T Th, 10. Laboratory, T Th, 11–2. Credit, two hours. Miss Rose.

The lectures include a discussion of the methods of investigating dietary problems; the practical means of applying scientific principles in planning family and institution dietaries; consideration of special problems of nutrition, as in infant feeding and feeding cases of abnormal nutrition. The laboratory work will include practice in planning and preparing dietaries of various types. Laboratory fee, $3.00.

C. **Principles of Household Economy.** Lectures, daily except S, at 8. Credit, two hours. Miss Van Rensselaer.

(a) Domestic factors in cost of living; waste, social and individual; production and distribution; exhaustion of supply; adulteration; standards of living; extravagance; effects of cost of living; (b) cost of food, shelter, clothing; wholesale and retail prices; marketing; (c) family budgets; distribution of income; keeping accounts; savings and investments; (d) domestic service; wages and hours of labor; cost of employment; relation of the employer to the employed; (e) the house: location, plan, furnishing, keeping clean; amenities of household life.

D. **Household Sanitation.** Lectures, daily except S, at 9. Credit, two hours. Miss Van Rensselaer.

Household bacteriology; cleanliness of soil, air, water, food; disposal of waste; the laundry; preservation of foodsupplies; insects as a source of disease; infection; immunity; methods of disinfection; care of the sick; good housekeeping in relation to public health; healthful living to promote efficiency; physical exercise and rest.

OFFICIAL PUBLICATIONS OF CORNELL UNIVERSITY

Issued at Ithaca, N. Y., monthly from July to November inclusive, and semi-monthly from December to June inclusive.

[Entered as second class matter, August 31, 1910, at the post office at Ithaca, N. Y., under the Act of July 16, 1894.]

These publications include the Book of Views of the Campus, for which a charge of twenty-five cents a copy is made, and the following publications, any of which will be sent gratis and post-free on request:

General Circular of Information for prospective students,
Announcement of the College of Arts and Sciences,
Courses of Instruction in the College of Arts and Sciences,
Announcement of Sibley College of Mechanical Engineering and the Mechanic Arts,
Announcement of the College of Civil Engineering,
Announcement of the College of Law,
Announcement of the College of Architecture,
Announcement of the Medical College,
Announcement of the New York State College of Agriculture,
Announcement of the Winter Courses in the College of Agriculture,
Announcement of the Summer School in Agriculture,
Announcement of the New York State Veterinary College,
Announcement of the Graduate School,
Announcement of the University Summer Session,
Annual Reports of the President and the Treasurer,
Samples of entrance and scholarship examination papers, special departmental announcements, etc.

Correspondence concerning the publications of the University should be addressed to

The Registrar of Cornell University,
Ithaca, N. Y.

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VOLUME III NUMBER 13

NEW YORK STATE COLLEGE OF AGRICULTURE

ANNOUNCEMENT OF THE SECOND SUMMER SCHOOL IN AGRICULTURE

JULY 6-AUGUST 16

1912

JULY 1, 1912
PUBLISHED BY CORNELL UNIVERSITY
ITHACA, NEW YORK

This announcement is intended to give detailed information to prospective students in the Summer School in Agriculture at Cornell University.

For general information concerning the University and the work in its various colleges during the academic year, the requirements for admission, etc., the General Circular of Information should be consulted. This and the other Official Publications of Cornell University are listed on the last page of the cover of this pamphlet. Any one of the informational publications there mentioned will be sent gratis and post-free on application to the Registrar of Cornell University, Ithaca, N. Y.

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CALENDAR

SUMMER SCHOOL IN AGRICULTURE 1912

In order to get the full number of exercises announced for the Summer School, it is necessary that all work begin promptly on Monday morning, July 8. Students are therefore urged to reach Ithaca in time to be present at the first exercise in each class. If possible, they should register on Saturday, July 6; if not, they should register on Monday during the hours not occupied in class work.

July 6, Saturday,	9 a.m. to 5 p.m. Registration first at office of Registrar, Morrill Hall, and then with the Secretary, College of Agriculture, Main Building, Room 122.
July 8, Monday,	Instruction begins at times and places announced under each course. Registration continued.
July 9, Tuesday evening, and following Tuesdays,	Musical recital, Sage Chapel. The Director of the University Summer Session will make a brief address.
Wednesday evenings,	Country-life addresses and assemblies of Summer School students as announced in weekly calendar.
July 11, Thursday evening, and following Thursdays,	Musical recital, Sage Chapel.
July 13, Saturday, before 1 p.m.	Last day for the payment of fees at the Treasurer's office, 1 Morrill Hall.
July 15, Monday evening,	First lecture in Monday evening course. Continued on following Mondays. Rockefeller Hall.
August 15, 16, Thursday and Friday,	New York State Examinations for Teachers' Certificates.
August 16, Friday,	Examination for entrance credit in Agriculture.
August 16, Friday,	Summer School closes.

A weekly calendar is published by the University. During the Summer School it will be mailed to any address on receipt of twenty-five cents at the Registrar's Office.

It is expected that a special training conference for rural leaders will be held at the College of Agriculture June 25 to July 5, inclusive. Information may be had on application to the Secretary, College of Agriculture.

CALENDAR

ACADEMIC YEAR 1912–13

September 13, Friday,	Entrance examinations begin.
September 23, Monday,	Academic year begins. Registration of new students. Scholarship examinations begin.
September 24, Tuesday,	Registration of new students.
September 25, Wednesday,	Registration of old students.
September 26, Thursday,	Instruction begins. President's annual address to the students.

CORNELL UNIVERSITY SUMMER SCHOOL IN AGRICULTURE, 1912

OFFICERS

Jacob Gould Schurman, LL.D., President of the University.
Liberty Hyde Bailey, LL.D., Director of the College of Agriculture.
David Fletcher Hoy, M.S., Registrar of the University.
Albert Russell Mann, B.S.A., Secretary to the College of Agriculture.

FACULTY

The members of the faculty are, except when the contrary is indicated, regular members of the Cornell University staff of instruction.

Henry Hiram Wing, M.S. in Agr., Professor of Animal Husbandry.
John Lemuel Stone, B.Agr., Professor of Farm Practice.
James Edward Rice, B.S.A., Professor of Poultry Husbandry.
George Walter Cavanaugh, B.S., Professor of Chemistry in its Relations with Agriculture.
Herbert Hice Whetzel, A.B., M.A., Professor of Plant Pathology.
William Alonzo Stocking, jr., M.S.A., Professor of Dairy Industry.
Charles Scoon Wilson, A.B., M.S.A., Professor of Pomology.
Charles Henry Tuck, A.B., Professor of Extension Teaching.
Wilford Murray Wilson, M.D., Professor of Meteorology.
James George Needham, Ph.D., Professor of General Biology, Limnology, and Nature Study.
Edward Gerrard Montgomery, M.A., Professor of Farm Crops.
Flora Rose, B.S., M.A., Professor of Home Economics.
Martha Van Rensselaer, A.B., Professor of Home Economics.
William Albert Riley, Ph.D., Assistant Professor of Entomology.
Merritt Wesley Harper, M.S., Assistant Professor of Animal Husbandry.
Clarence Arthur Rogers, M.S.A., Assistant Professor of Poultry Husbandry.
Glenn Washington Herrick, B.S.A., Assistant Professor of Economic Entomology.
Howard Wait Riley, M.E., Assistant Professor of Farm Mechanics.
Cyrus Richard Crosby, A.B., Assistant Professor of Entomological Investigations.
Harold Ellis Ross, M.S.A., Assistant Professor of Dairy Industry.
Elmer Seth Savage, M.S.A., Ph.D., Assistant Professor of Animal Husbandry.
Lewis Knudson, B.S.A., Ph.D., Assistant Professor of Plant Physiology.
Alvin Casey Beal, Ph.D., Assistant Professor of Floriculture.
James Chester Bradley, Ph.D., Assistant Professor of Systematic Entomology.
Kenneth Carter Livermore, B.S. in Agr., Assistant Professor of Farm Management.
Vaughan MacCaughey, Professor of Botany, The College of Hawaii.

Lewis Josephus Cross, B.A., Instructor in Agricultural Chemistry.
Edward Sewall Guthrie, M.S. in Agr., Instructor and Investigator in Dairy Industry.
Paul Work, B.S., A.B., Instructor and Investigator in Olericulture.
Roy David Anthony, B.S. in Agr., Instructor in Pomology.
Robert Matheson, M.S. in Agr., Ph.D., Instructor in Biology.
George C. Embody, Ph.D., Instructor in Aquiculture.
Harry Oliver Buckman, M.S.A., Instructor in Soil Technology.
Earl Whitney Benjamin, B.S. in Agr., Instructor in Poultry Husbandry.
Alice Gertrude McCloskey, A.B., Associate in Rural Education.
Walter Warner Fisk, B.S. in Agr., Assistant in Dairy Industry.
Thomas Joseph McInerney, B.S. in Agr., Assistant in Dairy Industry.
Edward Mowbray Tuttle, B.S. in Agr., Assistant in Rural Education.
Charles Paul Alexander, Assistant in Biology.
Olney Brown Kent, Assistant in Poultry Husbandry.
Millard Alschuler Klein, B.Sc., Assistant in Soil Technology.
Katharine Row Moore, Preceptress, Penn Yan Academy.
Cora Amelia Smith, A.B., Assistant in Nature Study.
Charles Edward Hunn, Gardener.

OBJECT AND SCOPE OF THE SUMMER SCHOOL IN AGRICULTURE

The primary object of the Summer School in Agriculture is to further agricultural education by aiding those engaged in it. The courses are arranged to meet the needs of the following classes:

(1) Persons who desire to teach agriculture, including nature study, home economics, and entomology, or to pursue investigations in agriculture.

(2) College students in Cornell or other universities who wish to use a part of the summer vacation for additional study or to make up deficiencies.

(3) Students entering the University who desire to secure surplus credits at entrance or to secure credit in entrance agriculture.

(4) All persons qualified to pursue any course given, whether or not they are engaged in study or in teaching. The courses will be serviceable for those who desire to put the training into immediate practical use on the farm, in the garden, or in the home.

To meet these several needs, the courses have been arranged in the following five groups:

I. Agriculture. In this group elementary instruction is offered in soils, animal husbandry, farm crops, economic entomology, poultry husbandry, vegetable gardening, meteorology, agricultural chemistry, dairying, farm management, plant diseases, pomology, farm mechanics, and floriculture. The instruction is adapted primarily for teachers, superintendents, and supervisors who desire to start in this field. Subjects in Agriculture required by the New York State Syllabus for Secondary Schools are covered in these courses.

II. Agriculture. In this group more advanced instruction is offered in agricultural chemistry, animal husbandry, farm crops, farm poultry, plant physiology, dairying, plant pathology, and soils, for college students and other persons desiring more extended training in one or more of these subjects. Subjects in this group and in the group preceding will be helpful to those who are already engaged in farming and who desire some special training.

III. Nature Study and Elementary Agriculture. General nature study, natural history methods, elementary agriculture, rural school education, school gardening, and textbook work in agriculture are included in this group. The work is intended primarily for teachers and superintendents, but is open to other qualified persons who desire a more intimate acquaintance with the out-of-doors. The courses cover the work in elementary agriculture and nature study as outlined in the New York State Syllabus.

IV. Home Economics. Courses in foods, human nutrition, home economics, household sanitation, and extension work are offered for teachers, college students, and housekeepers.

V. Entomology. In this group special instruction is offered in general entomology, morphology and classification of insects, aquatic insects, economic entomology, insects and diseases, photography and lantern-slide making, systematic entomology, and special investigations, for teachers, college students, and investigators.

The regular Summer Session of the University will be in session at the same time as the Summer School in Agriculture. Any of the courses in the University Summer Session may be elected by qualified students registered in the Summer School in Agriculture. For a course thus elected by residents of New York State, a fee of $15 will be charged; for two or more courses, a fee of $25 will be charged. Announcements of the University Summer Session may be had on application to The Registrar, Cornell University.

ADMISSION, ATTENDANCE, REGISTRATION

There is no examination for admission to the Summer School in Agriculture. Each person, however, must satisfy the instructor in charge of any course that he is qualified to pursue the work of the course. Any duly registered student in the Summer School in Agriculture may visit other classes than those for which he is specifically registered.

All students are required to register first at the office of the University Registrar in Morrill Hall. They may register on Saturday, July 6, between 9 a.m. and 5 p.m., or on the day of their arrival if they reach Ithaca later than July 6. Registration on July 6 is urged. Class exercises begin at 8 a.m., Monday, July 8. The Registrar's office is open from 9 a.m. to 4 p.m. every day except Saturday, when it is closed at noon. Students will report at the office of the Secretary, College of Agriculture, Room 122, Main Building, immediately after registering with the Registrar of the University.

TUITION FEE

Tuition in the Summer School in Agriculture is free to residents of New York State and to students registering in the Graduate School in Cornell University. Non-residents will be charged a tuition fee of $25, whether one subject or more be taken. This must be paid at the office of the Treasurer, Room 1, Morrill Hall, within five days after registration day. Students who pay the fee of $25 may take work in the University Summer Session without extra charge. In case of withdrawal, for reasons satisfactory to the Treasurer and to the Registrar, within five days from the first registration day, the tuition may be refunded and the charge canceled. In case of withdrawal within two weeks after the first registration day, one-half the tuition may be refunded. In case of registration after the first three weeks of the School, students must pay two-thirds of the full tuition fee.

LABORATORY FEES

Fees to cover the cost of materials used will be charged in a few courses and are announced in connection with those courses. Fee cards must be procured at the first class-period in each of the courses concerned. The receipted fee cards must be returned to the instructor in charge of the course within five days after the beginning of the course.

ACADEMIC CREDIT FOR WORK

Academic credit will be allowed for certain courses in agriculture, nature study, home economics, and entomology, as announced in connection with those courses. On the completion of the first agricultural group, one unit in entrance agriculture will be given to those persons who pass an examination for that purpose at the close of the Summer School.

In the College of Agriculture. The requirements for the degree of Bachelor of Science in Agriculture are residence for eight terms (four years), and the completion of one hundred and twenty hours ("points") of elective work. A student who has satisfied the entrance requirements of the College and has afterward completed in two or more summer sessions, either in the Summer School in Agriculture or in the regular University Summer Session, at least twelve hours of work in courses approved by the departments concerned, may be regarded as having thus satisfied one term of residence. Work done in summer sessions shall be accepted as the equivalent of not more than two terms of residence. The maximum amount of credit toward the degree of Bachelor of Science in Agriculture that is allowed for the work of any one summer session is seven hours.

Certificates for work. Students in the Summer School who are not matriculated in the University may receive certificates of attendance and of work satisfactorily performed. Application for such certificate must be made before August 16, and the applicant must leave at the office of the University Registrar a large envelope stamped and bearing his home address. The certificate will then be forwarded by mail.

COST OF LIVING

The cost of board and furnished room in Ithaca during the Summer School runs from $5.50 a week upward. In some cases the cost has been reduced to $5, or even $4.50, but it is not safe to count on less than $5.

The price of a single furnished room may be as low as $1 a week. The prices advance with the size and location of the rooms.

Rooms are engaged with the understanding that they will be occupied for the entire session, unless otherwise agreed on by both parties. Table board is usually engaged by the week, or, if so stated, by the day.

The price of table board runs from $4 and $4.50 in boarding houses, to $7 and $10 at the hotels. Living at hotels costs from $10.50 up.

The University has one residence hall, Sage College, with an annex, Sage Cottage. This is open for women throughout the Summer School. Married men accompanied by their wives may be lodged in Sage Cottage, where the first and second floors are reserved for them. The price of rooms in Sage College is $1.25 to $5.50 a week, according to location, and the price of table board is $5. Unfortunately, at the time this announcement goes to press the capacity of the building has been almost entirely engaged. Persons strongly preferring to room in the university dormitories may make application to The Manager of Sage College, Ithaca, N. Y., and be placed on the waiting list in case vacancies should occur. Every application for a room to be reserved must be accompanied by a deposit of $5, otherwise the application is not registered. The amount of this deposit is deducted from the rent if the room assigned be occupied by the applicant; it is refunded if the applicant gives formal notice to the manager on or before June 15 that she desires to withdraw the application.

Persons desiring assistance in engaging comfortable rooming and boarding places will, on application to The Secretary, College of Agriculture, after June 1, be furnished with a list of approved places.

The whole expense of attendance at the Summer School, not including laboratory fees, may be estimated at $65 to $85.

THE LIBRARIES

The University Library is open on week days from 9 a.m. to 5 p.m., except Saturday, when it closes at 1 p.m. In this are housed the main library, containing about four hundred thousand volumes, and most of the seminary and special libraries. The main reading room affords accommodations for over two hundred readers, and contains a selected library of over eight thousand volumes of reference works. Adjacent to it is the periodical room, in which are kept the current numbers of about five hundred journals in various fields of knowledge. These rooms are open to all students. Students properly qualified are allowed the use of the seminary rooms and of the books in them. The main collection is primarily a library of reference for use in the building. Students are, however, allowed to a limited extent to take out books for home use. Persons wishing this privilege must make a deposit of $5, which will be refunded on the return of all books taken out

The library of the College of Agriculture, on the first floor of the main building, is open on week days from 9 a.m. to 5 p.m., except Saturday, when it closes at 1 p.m. In it will be found a large collection of bulletins and reports of experiment stations, reference books on agriculture and country life, agricultural periodicals, and the like. The entomological library, housed in the Department of Entomology on the third floor of the main building, is one of the most complete of its kind in the United States. Nearly all of the departments in which instruction is given have well-selected departmental libraries.

LECTURES, MUSICAL RECITALS, EXCURSIONS

In addition to the regular class room work there will be evening lectures on topics of general interest through the session.

For several years the lectures before the University Summer Session on Monday evenings have formed a course treating problems in some field of science. In 1912 they will be given by Professor J. S. Shearer on chosen topics in physics. These lectures are open to students in the Summer School in Agriculture.

In addition to these there are weekly lectures of general interest in connection with the various departments. Notice of these will be given in the University Calendar each week.

Musical recitals will be given on Tuesday and Thursday evenings in the Sage Chapel.

On occasional Wednesday evenings special lectures on agricultural or country life subjects, or informal assemblies of all students registered in the Summer School in Agriculture, will be arranged. Notice of these will be given from week to week. In connection with the work of several departments excursions are made to points of interest. Most of these are open to members of the Summer School. Notice of them is given from week to week.

An informal reception of all summer students will be held on some evening at the beginning of the summer session. This, it is hoped, will assist students in the Summer Session and the Summer School in becoming acquainted with the members of the staff of instruction and with one another.

RAILROAD ROUTES AND RATES

Ithaca is reached by either the Lehigh Valley or the Lackawanna Railroad. By the latter, a branch leaves the main line at Owego. Through trains run from New York and Buffalo on the Lehigh, and through sleeping cars run daily from New York on both roads. From Philadelphia, Baltimore, Washington, and the South, via the Baltimore & Ohio, the Philadelphia & Reading connects with the Lehigh at Bethlehem. On the Lehigh, through trains for Ithaca connect with the New York Central at Auburn, and with the Pennsylvania (Northern Central) and the Erie at Elmira.

From nearly all important points in the Middle and Atlantic Coast States summer excursion tickets may be purchased to Ithaca. From Central and Western States it is generally possible to buy excursion tickets to Niagara Falls, in case an excursion rate to Ithaca is not available.

At the time this pamphlet goes to press it is not possible to give specific rates. Persons interested should, some time in advance of their departure, make inquiry of the railroad agent at their home town. If full information cannot be obtained in this way, write to the Secretary of the College of Agriculture.

COURSES OF INSTRUCTION

The courses of instruction are announced in five distinct groups or schools, namely, agriculture (2), nature study and elementary agriculture, home economics, and entomology. Persons in the Summer School may specialize in any one of these groups, or may elect such courses from any of them as they may be able to schedule and are qualified to pursue. Ordinarily it will be advantageous to confine one's attention chiefly to the subjects in one of the groups, and to return another summer if instruction in a second group is desired.

I. AGRICULTURE

The following courses, numbered one to fourteen inclusive, are intended primarily for school superintendents, high-school teachers, and others desiring to cover the field of agriculture in a general way during the Summer School. They are scheduled so that all may be taken without conflict; or one or more may be omitted and elective subjects from other groups added, as desired. The first seven courses will continue for three weeks, July 8 to 27, when they will be discontinued and the last seven (numbers 8 to 14) taken up for three weeks, July 29 to August 16. No university credit is allowed for any of these fourteen courses; but certificates showing work done are given on application at the close of the Summer School.

Courses given during the first three weeks, July 8 to 27

1. **Animal Husbandry.** Lectures, T Th S, 9, Animal Husbandry Lecture Room. Practice, T, 2–4.30, Judging Pavilion. Professor Wing and Assistant Professors Harper and Savage.

A discussion of the principles of feeding horses and dairy cattle, principles of breeding animals, and the historical development of the leading breeds of horses and dairy cattle.

2. **Economic Entomology.** Lectures, F S, 8, Main 292. Laboratory, S, 10–12.30, Main 392. Assistant Professor HERRICK.

A course in which the common insect pests of the farm, garden, and orchard are discussed and measures of control considered. The lectures will be illustrated by specimens, charts, and lantern slides. One laboratory period a week will be devoted to a study of the actual insects in the laboratory and field.

3. **Farm Crops.** Lectures, M W F, 9, Main 292. Laboratory, F, 2–4.30, Agronomy 202. Professor MONTGOMERY and others.

Classification of farm crops; agricultural importance of various classes; and a brief study in class room and laboratory of the principal types of importance in New York State.

4. **Poultry Husbandry.** Lectures, T Th, 10, Dairy 222. Laboratory, Th, 2–4.30, Main 202. Professor RICE, Assistant Professor ROGERS, Mr. BENJAMIN, and Mr. KENT.

The subjects to be discussed in the lectures are: the breeds; poultry house construction; feeding for egg production; marketing; rearing chickens; breeding for egg production. The laboratory exercises include: judging the breeds; grading and candling eggs; study of the egg. Laboratory fee, fifty cents.

5. **Soils.** Lectures, M W F, 10, Main 292. Laboratory, W, 2–4.30 and F, 11–1, Agronomy 42. Mr. BUCKMAN and Mr. KLEIN.

A practical course in soils, their primary characteristics and modes of handling. The lectures will include a discussion of the formation and classes of soils; tilth; soil moisture; soil amendments; fertilizers and manures; soil biology; and soil management from the standpoint of plant production. The laboratory work will consist in field trips and demonstrations. Some knowledge of geology and chemistry will be a great aid in pursuing this course. Laboratory fee, fifty cents.

6. **Vegetable Gardening.** Lectures, M W, 11, Main 232. Laboratory, M, 2–4.30, Greenhouses. Mr. WORK.

The lectures will include: a brief outline of the scope of the subject; a discussion of a few of the problems and methods that are peculiar to it; the planning and management of the home garden; vegetable crops from both home and commercial standpoints. The laboratory work will be planned to bring the student into touch with vegetable gardening problems and practices, as illustrated in the college and in neighboring greenhouses and gardens.

7. **Weather, Climate, and Crops.** Lectures, T Th, 11, Main 292. Professor W. M. WILSON.

The fundamentals necessary to an understanding of the earth's atmosphere as a whole; the distribution and relation of temperature, pressure, winds, and moisture; the principles of weather forecasting; frosts and methods of protection; and the relation of weather and climate to general and special agriculture.

Courses given during the second three weeks, July 29 to August 16

8. **Agricultural Chemistry.** Lectures, M W F, 10, Morse Hall Lecture Room 3. Laboratory, W, 2–4.30, Quantitative Laboratory, Morse Hall. Professor CAVANAUGH and Mr. CROSS.

A discussion of the relations of chemistry to agriculture, including the sources of fertilizing materials, their preparation for use, and a study of the various forms of lime.

9. **Farm Management.** Lectures, M W F, 9, Main 292. Laboratory, S, 8–10.30, Agronomy 202. Assistant Professor LIVERMORE.

Lectures on the more important principles of farm management. Discussions and laboratory work on types of farming, cropping systems, farm accounts, farm layout, marketing, and successful farms.

10. **Farm Mechanics.** Lectures, T Th, 11, Animal Husbandry Lecture Room. Laboratory, F, 11–1, Farm Mechanics Building. Assistant Professor H. W. RILEY.

The work in this subject will be arranged to show the method of giving instruction in farm mechanics. Rope splicing, belt lacing, the plow, the grain binder, and the gasoline engine will be used as the subjects for laboratory study.

11. **Floriculture.** Lectures, M W, 11, Main 232. Practice, M, 2–4.30, Greenhouses. Assistant Professor BEAL.

The lectures will include a brief outline of the scope of the subject; the use of flowers in and around the home; flower crops for the farm; flowers from a commercial standpoint; floricultural opportunities in the state and nation. The laboratory work is designed to give the student practice in the propagation, potting, shifting, and care of plants. The culture of the important flower crops will be illustrated by plants growing on the horticultural grounds.

12. **Milk and its Products.** Lectures, T Th, 9, Dairy 222. Laboratory, T, 2–4.30, Dairy 232. Professor STOCKING, Assistant Professor ROSS, Mr. GUTHRIE, and Mr. FISK.

The lectures will discuss bacteria in relation to dairy products; testing of milk; composition of milk; butter making; cheese making, with special reference to fancy cheese. The laboratories will include work on the nature of bacteria and their action on dairy products, and on the testing of milk for fat and for solids.

13. **Plant Diseases.** Lectures, T Th, 8, Main 292. Laboratory, Th, 2–4.30, Agronomy 302. Professor WHETZEL and Mr. ———.

The lectures will discuss some of the more common diseases of fruit and other crops, with practical means of control. A microscopical study of the organisms causing these diseases will be made in the laboratory, together with an examination of the effect of the diseases on the plants. The relation of the control of the disease to the life history of the causal organism will be explained. Laboratory fee, seventy-five cents.

14. **Pomology.** Lectures, T Th, 10, Main 292. Laboratory, F, 2–4.30, Main 202. Professor C. S. WILSON and Mr. ANTHONY.

A study of the principles and practice of fruit growing. The topics considered are: methods of propagation, including budding and grafting; soils; varieties and planting plans; cultivation, cover crops, fertilization, spraying, and pruning; the picking, grading, and marketing of fruit.

II. AGRICULTURE

The following courses, each continuing for six weeks, are intended for persons desiring special training in the subjects. They are much more extended than those given above (pages 11–13). With the outside study required, each will occupy one-third to one-half of the student's time. University credit is allowed for the work. The courses are comparable with the introductory courses in the same departments given during the regular university year, and will be accepted for graduation in place of those courses.

A. **Agricultural Chemistry.** Credit three hours. Prerequisite Chemistry 1 or its equivalent. Lectures, daily except S, 9. Recitations, T Th, 10. Morse Hall Lecture Room 3. Professor CAVANAUGH and Mr. CROSS.

A general course treating of the relations of chemistry to agriculture and dealing with the composition and chemical properties of plants, soils, fertilizers, feeding stuffs, insecticides, and fungicides.

B. **Agricultural Chemistry.** Credit one hour. Prerequisite Chemistry 1 and 6 or the equivalent. M W F, 10–1, Qualitative Laboratory, Morse Hall. Professor CAVANAUGH and Mr. CROSS.

A laboratory course supplementing course A. Laboratory deposit, $10.

A. **Principles and Practice of Feeding Animals.** Credit two hours. Lectures, M W F, 10. Practice, T Th, 10–12. Animal Husbandry Building. Assistant Professor SAVAGE.

The general principles of animal nutrition; the study of feeding standards the common grain and commercial feeds, the formulation of rations, etc.

B. **Principles of Animal Breeding.** Credit two hours. Lectures, daily except S, 9, Animal Husbandry Building. Assistant Professor HARPER.

A general discussion of the principles of heredity as applied to the breeding of animals, with a study of animal form; origin and formation of breeds; crossing and grading, with an outline of the methods of registration and the study of records and pedigrees. Demonstrations, essays, and reports will be required in addition to the lectures.

A. **Farm Crops.** Credit two hours. Lectures, T Th S, 8, Agronomy 192. Laboratory, T Th, 2–4.30, Agronomy 202. Professor MONTGOMERY and Mr. ——.

A general study of the principal cereal and forage crops in New York State, their distribution, important soil and climatic requirements, and cultural methods. Laboratory fee, $1.

A. **Farm Poultry.** Credit one hour. Lectures, T Th, 12, Dairy 222. Laboratory, W, 2–4.30, Main 202. Professor RICE, Assistant Professor ROGERS, Mr. BENJAMIN, and Mr. KENT.

The subjects discussed at the lectures are: the breeds; poultry house construction; preparation of eggs for market; preparation of poultry for market; marketing of poultry and eggs; incubation; rearing of chickens; the principles of breeding; breeding for egg production; poultry farm management; feeding for egg production; diseases of poultry. The subjects to be presented in laboratories are: judging the breeds; grading and testing eggs; grading and packing poultry; anatomy of poultry; study of the egg; study of feeds and sanitation. Laboratory fee, $1.

A. **General Plant Physiology.** Credit four hours. Prerequisite all freshman work in agriculture or its equivalent. Lectures, daily, 9, Agronomy 192. Laboratory, daily, 10–12.30, Agronomy 21. Assistant Professor KNUDSON.

Lectures and laboratory work supplemented by field studies. The topics include absorption, metabolism, relation to environment, growth, reproduction, and propagative process. Laboratory fee, $5.

B. **Special Problems in Plant Physiology.** Special work in certain phases of physiology, including ecology and fermentation. Admission to work and hours arranged only by appointment. Assistant Professor KNUDSON.

A. **Milk Composition and Tests.** Credit two hours. Lectures, M W F, 8, Dairy 222. Laboratory, M W F, 2–4.30, Dairy 232. Assistant Professor Ross and Mr. McInerney.

The topics considered are secretion and composition of milk, samples, lactometer, Babcock fat test, acid tests, moisture test, salt test, preservative tests. Laboratory deposit, part returnable, $3.

A. **Plant Pathology.** Credit three hours. Prerequisite Botany 1 and 2 or the equivalent. Lectures, M W F, 8, Agronomy 302. Laboratory, T W Th F, 2–4.30, Agronomy 302. Professor Whetzel and Mr. ———.

A fundamental course treating of the common diseases of cultivated plants, their nature, cause, and control. A prerequisite to all other courses in plant pathology. Laboratory fee, $4.50.

A. **Principles of Soil Management.** Credit three hours. Prerequisite Chemistry 1 and Geology 1 or the equivalent. Lectures, daily except S, 8, Agronomy 152. Laboratory, M T Th, 2–4.30, Agronomy 42. Mr. Buckman and Mr. Klein.

A fundamental course dealing with the origin, composition, and properties of soils with particular reference to their management in crop production. The laboratories will consist in practice designed to demonstrate fundamental physical relations, and will be supplemented by laboratory lectures. Laboratory deposit, $3.

III. NATURE STUDY AND ELEMENTARY AGRICULTURE

Each of the following courses will continue throughout the six weeks of the Summer School.

A. **General Nature Study.** Credit two hours. Lectures, M W, 9, Main 302. Field and laboratory observations, M W F, 2–4.30. Dr. Embody and Miss Smith.

I. First three weeks: observation of the habits of common birds, with special reference to their nesting; the habits of the toad, frog, salamander, turtle, and other reptiles; special attention to the habits and haunts of common fishes; field notes on the habits of common wild mammals, including squirrels, chipmunks, mice, moles, woodchucks, etc.; a study of the natural habits and adaptations of some of the domestic animals, including the horse, cow, sheep, and pig; of the life histories of some common butterflies and moths, and other insects of orchard and garden; aquatic insects; and a study of the honeybee in observation hives.

II. Second three weeks: field observations on the life histories of the plants of the garden, open fields, moist ravines, marshes, and woods, special attention being given to the relation of the plants of the garden to their insect visitors; observations on the character, the habitat, and the fruit of common trees, especially fruit and nut trees, evergreens, and shade trees.

III. Lectures, first three weeks, to supplement and elucidate the field work in part I, including also the use of this material in the school, and the building and maintaining of breeding cages and aquaria.

IV. Lectures, second three weeks, on the habits, life histories, and uses of the plants and trees studied in part II, and the literature concerning them.

B. **Training Course in Natural History Method.** Credit one hour. Field and laboratory work, T Th, 8–11, Main 302. Professor Needham, Dr. Embody, and Mr. Alexander.

More careful and extended work in a few selected natural history subjects. The work of the first three weeks will center about pond life; that of the second three weeks, about the relations between flowers and insects. The students will gather their own material, and a considerable part of the work will be done by each one individually and alone. Results will be rigidly graded, and university credit will be given for satisfactory completion of the course. Each student will provide himself with a good pocket lens, air and water nets, and the book containing outlines of the practical exercises. Membership in the class will be limited to twenty persons.

C. **Elementary Agriculture and Nature Study.** Lectures, demonstrations, and conferences, T Th, 2–4.30, Rural Schoolhouse. Miss McCloskey and Mr. Tuttle.

Pedagogical work in elementary agriculture and nature study as outlined in the New York State Syllabus. This course is designed for district superintendents, training-class teachers, and all other teachers interested in rural education. The Cornell Rural School Leaflet, in which is published subject matter on the topics outlined in the New York State Syllabus. will furnish the text for this course. Subject matter will be presented and schoolroom methods of conducting the lessons demonstrated. Professors in the College of Agriculture who have prepared the articles for the Leaflet will give lectures and demonstrations. The fundamental educational value as well as the economic importance of school work in soils, animal husbandry, farm crops, gardening, fruit growing, poultry, forestry, bird study, and the like will be discussed. Simple apparatus suitable for use in schools will be considered; also books for the school library. The Rural Schoolhouse will be made a center for working out some of the problems relating to school work in elementary agriculture and nature study.

Excursions. 1. An afternoon on the farm with a naturalist and an agriculturist. 2. A night trip to the woods.

D. **Rural School Education.** Lectures, M W, 10, Agronomy 192. Professor MacCaughey, Professor Tuck, Miss McCloskey, and others.

This course will consider rural school conditions; the field of agriculture in education; the relations of school and community; teachers' associations; farmers' institutes; extension work; the relation of rural schools; the rural schoolhouse and grounds; the rural teacher; the rural library; and other topics of importance in rural education.

E. **School Gardening.** Lectures and laboratory, F S, 8–11, Rural schoolhouse and Gardens. Professor MacCaughey, Miss McCloskey, and Mr. Hunn.

This course will include several lectures on school gardens in city and country; practical work on soils; preparing the ground; planting; caring for the garden; harvesting; exercises in judging garden plats; discussion of trees, vines, shrubs, and herbaceous plants suitable for the school garden; a child's home garden; discussion of window boxes; the nature study of the garden; literature.

F. **Textbook Work in Agriculture.** Daily except S, 11, Agronomy 192. Professor MacCaughey and Miss Moore.

Designed to help teachers to use intelligently a textbook in agriculture in high schools or in the seventh and eighth grades. Demonstrations in connection with the lectures. Model lessons will be given with classes of girls and boys.

G. **Trips Afield.** A series of dawn and sunset walks, to some of the interesting places near the Campus. T, 6 a. m., Th, 6.30 p. m. Professor MacCaughey and others.

The trips will be short, will not exceed an hour and a half in time, and will be entirely informal in character. The provisional program is: T, over the farm, Forest Home path; Cascadilla path; Ithaca Falls; Beebe Lake; over the farm. Th, the pine woods; Cornell Heights woods; Six-mile Creek; Renwick marshes; South Hill.

IV. HOME ECONOMICS

Each of the following courses will continue throughout the six weeks of the Summer School. All work is given on the fourth floor of the main building of the College of Agriculture.

A. **Foods.** Credit four hours. Lectures and recitations, daily except S, 9. Laboratory practice, daily except S, 11–1.30. Professor Rose.

A course for establishing a fundamental knowledge of foods. The lectures will include a discussion of the sources, composition, and characteristics of foodstuffs; principles governing the selection of foods and methods of preparing them; food preservation; comparative nutritive value and cost of various foods; selection, planning, and serving of well-balanced meals. The laboratory work, closely following the lectures, will consist of experiments in determining the characteristics of foodstuffs as these relate to the preparation of food and to practical problems of cookery.

B. **Human Nutrition.** Credit two hours. Lectures and recitations, daily except S, 10. Professor Rose.

A discussion of the methods of investigating dietary problems; the practical means of applying scientific principles in planning family and institution dietaries; consideration of special problems of nutrition, as in infant feeding and feeding in cases of abnormal nutrition.

C. **Home Economics.** Credit two hours. Lectures and recitations, daily except S, 8. Professor Van Rensselaer.

Domestic factors in cost of living; waste; standards of living; extravagance. Cost of food, shelter, clothing; marketing. Family budgets; distribution of income; savings. Domestic service.

D. **Household Sanitation.** Credit one hour. Lectures and recitations, M W F, 11. Professor Van Rensselaer.

Household bacteriology; cleanliness of soil, air, water, food; disposal of waste; insect pests, infection, immunity, methods of disinfection; good housekeeping in relation to public health; healthful living to promote efficiency; physical exercise and rest.

E. **Extension in Home Economics.** Credit one or two hours. Lectures, T Th, 11. Practice by appointment. Professor Van Rensselaer.

Principles of extension work with special reference to rural communities; organization; material to be presented; manner of presentation; speaking; writing.

V. ENTOMOLOGY

The instruction in entomology, formerly given in the University Summer Session, has now been transferred to the Summer School in Agriculture. The following courses will be continued throughout the six weeks of the Summer School. Students qualified to do advanced work will be granted the facilities of the laboratories, field stations, and library, after the close of the regular session. Members of the staff in residence during this period will be glad to consult with and aid such students.

Laboratory fees, varying with nature of materials demanded from $.50 to $1.50 for an hour of academic credit, will be charged in these courses.

A. **General Entomology.** Credit two or three hours. Lectures, daily except S, 8, Main 392. Laboratory and field work, for those not taking course B, M W F, 2–4.30, Main 391. Assistant Professor RILEY and Dr. MATHESON.

An introductory course dealing with the biology, habits, economic importance, and relationships of insects.

B. **Laboratory Course in the Morphology and Classification of Insects.** Credit two or more hours. Laboratory open daily except S, 8 to 5, Main 391. Assistant Professor RILEY and Dr. MATHESON.

Study of the external anatomy of typical insect forms; the collecting, mounting, and classifying of representatives of all the orders and the chief families of insects. While the systematic work will give a general survey of the field, each student may direct his energies toward the collecting of any group in which he is particularly interested.

C. **Research.** Opportunities will be offered for advanced work and research in various phases of entomology. Properly qualified students registered as candidates for advanced degrees may elect thesis work under any member of the department who is in residence during the summer.

Seminary. The work of an entomological seminary is conducted by the Jugatae, an entomological club that meets for the discussion of current literature and of the results of investigations.

Special Courses

In addition to the work outlined above the following special afternoon courses, one week each, will be offered by various members of the department. Emphasis will be placed on general principles and methods of work. Visitors who are especially interested in entomological subjects are invited to enroll for any part or for the entire series. Students who are registered for credit in the department may count attendance on these courses as laboratory time.

1. **Aquatic Insects.** Lectures and field work illustrative of the biology of aquatic insects. Entomological laboratories, Field Station in the Renwick marshes. July 8 to 12. Professor NEEDHAM.

2. **Aquatic Insects,** continued, with special reference to their utilization as fish food. Entomological Lecture Room and Experimental Fish Hatchery. July 15 to 19. Dr. EMBODY.

3. **Economic Entomology.** Its problems and methods. Lectures, demonstrations, field work, and discussion of insectary methods. July 22 to 26. Assistant Professor HERRICK.

4. **Insects and Disease.** Lectures, demonstrations, and laboratory work on the work of insects and their allies in the transmission and dissemination of diseases of man. July 29 to Aug. 2. Assistant Professor RILEY.

5. **Photography and Lantern-Slide Making as an Aid to Entomological Work.** Lectures and demonstrations, Insectary. August 5 to 9. Assistant Professor CROSBY.

6. **Systematic Entomology.** Field and laboratory work designed to familiarize the student with special methods of collecting and preparing insects for the cabinet. At least one night excursion will be arranged. August 12 to 15. Assistant Professor BRADLEY.

ADDITIONAL ELECTIVE COURSES

The regular Summer Session of Cornell University, which is in session at the same time, offers a great variety of courses, any of which may be elected by students in the Summer School in Agriculture on the payment of certain fees (see page 8). Particular attention is called to the following subjects: education, psychology, economics and social science, music, physics, chemistry, geography, geology, botany, zoology, physiology, and industrial education, including handwork. A course in meteorology and climatology, in addition to the brief course in the School in Agriculture, continues throughout the Summer Session.

OFFICIAL PUBLICATIONS OF CORNELL UNIVERSITY

Issued at Ithaca, N. Y., monthly from July to November inclusive, and semimonthly from December to June inclusive.

[Entered as second class matter, August 31, 1910, at the post office at Ithaca, N. Y., under the Act of July 16, 1894.]

These publications include

Catalogue Number (containing lists of officers and students), price 25 cents,
Book of Views, price 25 cents,
Directory of Faculty and Students, First Term, 1911–12, price 10 cents, and the following informational publications, any one of which will be sent gratis and post-free on request. The date of the last edtiton of each publication is given after the title.
General Circular of Information for prospective students, January 1, 1912.
Announcement of the College of Arts and Sciences, June 15, 1912.
Announcement of Sibley College of Mechanical Engineering and the Mechanic Arts, Feb. 15, 1912.
Announcement of the College of Civil Engineering, March 1, 1912.
Announcement of the College of Law, May 15, 1912.
Announcement of the College of Architecture, March 15, 1912.
Announcement of the New York State College of Agriculture, Oct. 1, 1911.
Announcement of the Winter Courses in the College of Agriculture, November 1, 1911.
Announcement of the Summer School in Agriculture, July 1, 1912.
Announcement of the New York State Veterinary College, April 15, 1912.
Announcement of the Graduate School, January 15, 1912.
Announcement of the Summer Session, April 1, 1912.
Annual Report of the President, December 1, 1911.
Pamphlets on scholarships, fellowships, and prizes, samples of entrance and scholarship examination papers, special departmental announcements, etc.

Correspondence concerning the publications of the University should be addressed to

The Registrar of Cornell University,
Ithaca, N. Y.

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OFFICIAL PUBLICATIONS OF CORNELL UNIVERSITY

VOLUME IV NUMBER 8

ANNOUNCEMENT OF THE THIRD SUMMER SCHOOL IN AGRICULTURE

JULY 7-AUGUST 15

1913

APRIL 1, 1913
PUBLISHED BY CORNELL UNIVERSITY
ITHACA, NEW YORK

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This announcement is intended to give detailed information to prospective students in the Summer School in Agriculture at Cornell University.

For general information concerning the University and the work in its various colleges during the academic year, the requirements for admission, etc., the General Circular of Information should be consulted. This and the other Official Publications of Cornell University are listed on the last page of the cover of this pamphlet. Any one of the informational publications there mentioned will be sent gratis and post-free on application to the Secretary of Cornell University, Ithaca, New York.

CALENDAR

SUMMER SCHOOL IN AGRICULTURE 1913

In order to get the full number of exercises announced for the Summer School, it is necessary that all work begin promptly on Monday morning, July 7th. Students are therefore urged to reach Ithaca in time to be present at the first exercise in each class. If possible, they should register on Saturday, July 5th; if not, they should register on Monday during the hours not occupied in class work.

July 5, Saturday,	9 a.m. to 5 p.m. Registration first at office of Registrar, Morrill Hall, and then with the Secretary, College of Agriculture, Main Building, Room 122.
July 7, Monday,	Instruction begins at times and places announced under each course. Registration continued.
July 8, Tuesday evening, and following Tuesdays,	Musical recital, Sage Chapel. The Director of the University Summer Session will make a brief address.
July 9, Wednesday evening, and following Wednesdays,	Country-life addresses and assemblies of Summer School students as announced in weekly calendar.
July 10, Thursday evening, and following Thursdays,	Musical recital, Sage Chapel.
July 12, Saturday, before 1 p. m.,	Last day for the payment of fees at the Treasurer's Office, 1 Morrill Hall.
July 14, Monday evening,	First lecture in Monday evening course. Continued on following Mondays. Rockefeller Hall.
August 14, 15, Thursday and Friday,	New York State Examinations for Teachers' Certificates; examination in agriculture for district superintendents.
August 15, Friday,	Summer School closes.

A weekly calendar is published by the University. During the Summer School it will be mailed to any address on receipt of twenty-five cents at the Secretary's Office.

A School for Leadership in Country Life will be held at the College of Agriculture, June 24 to July 4, 1913, inclusive. See page 22.

CALENDAR

ACADEMIC YEAR 1913–14

September 12, Friday,	Entrance examinations begin.
September 22, Monday,	Academic year begins. Registration of new students. Scholarship examinations begin.
September 23, Tuesday,	Registration of new students.
September 24, Wednesday,	Registration of old students.
September 25, Thursday,	Instruction begins. President's annual address to the students.

CORNELL UNIVERSITY SUMMER SCHOOL IN AGRICULTURE, 1913

OFFICERS

Thomas Frederick Crane, Litt.D., Acting President of the University.
Liberty Hyde Bailey, LL.D., Director of the College of Agriculture.
George Prentice Bristol, A.M., Director of the University Summer Session.
David Fletcher Hoy, M.S., Registrar of the University.
Albert Russell Mann, B.S.A., Secretary to the College of Agriculture.

FACULTY

Roy David Anthony, B.S. in Agr., Instructor in Pomology.
Earl Whitney Benjamin, M.S. in Agr., Instructor in Poultry Husbandry.
Bertha Betts, Assistant in Home Economics.
Clara Browning, B.S., Instructor in Home Economics.
Harry Oliver Buckman, M.S.A., Ph.D., Assistant Professor of Soil Technology.
George Walter Cavanaugh, B.S., Professor of Chemistry in its relations with Agriculture.
Charles Chupp, A.B., Assistant in Plant Pathology.
Anna Botsford Comstock, B.S., Lecturer in Nature Study.
George C. Embody, Ph.D., Assistant Professor of Aquiculture.
Walter Warner Fisk, M.S. in Agr., Instructor in Dairy Industry.
Harry M. Fitzpatrick, A.B., Instructor in Plant Pathology.
Merritt Wesley Harper, M.S., Assistant Professor of Animal Husbandry.
George R. Hill, jr., Ph.D., Research Assistant in Plant Physiology, Missouri Botanical Gardens.
Charles Edward Hunn, Foreman of Grounds.
Oskar Augustus Johannsen, Ph.D., Assistant Professor of Biology.
Olney Brown Kent, Assistant in Poultry Husbandry.
Millard Alschuler Klein, B.Sc., Assistant in Soil Technology.
Helen Knowlton, A.B., Assistant in Home Economics.
Lewis Knudson, B.S.A., Ph.D., Assistant Professor of Plant Physiology.
Alice Gertrude McCloskey, A.B., Associate in Rural Education.
Thomas Joseph McInerney, M.S. in Agr., Instructor in Dairy Industry.
Edward Gerrard Montgomery, M.A., Professor of Farm Crops.
Walter Mulford, B.S.A., F.E., Professor of Forestry.
Horace Mann Pickerill, B.S. in Agr., Instructor in Dairy Industry.
Frank E. Rice, A.B., Instructor in Agricultural Chemistry.
James Edward Rice, B.S.A., Professor of Poultry Husbandry.
William Albert Riley, Ph.D., Professor of Insect Morphology and Parasitology.
Clarence Arthur Rogers, M.S.A., Assistant Professor of Poultry Husbandry.
Flora Rose, B.S., M.A., Professor of Home Economics.

Harold Ellis Ross, M.S.A., Professor of Dairy Industry.
Elmer Seth Savage, M.S.A., Ph.D., Assistant Professor of Animal Husbandry.
William Alonzo Stocking, jr., M.S.A., Professor of Dairy Industry.
Anna Clegg Stryke, A.B., Artist and Instructor in Entomology.
Hugh Charles Troy, B.S.A., Professor of Dairy Industry.
Edward Mowbray Tuttle, B.S.A., Instructor in Rural Education.
Martha Van Rensselaer, A.B., Professor of Home Economics.
George Frederick Warren, Ph.D., Professor of Farm Management.
Charles Scoon Wilson, A.B., M.S.A., Professor of Pomology.
Paul Work, B.S., A.B., Instructor and Investigator in Olericulture.

OBJECT AND SCOPE OF THE SUMMER SCHOOL IN AGRICULTURE

The primary object of the Summer School in Agriculture is to further agricultural education by aiding those engaged in it. The courses are arranged to meet the needs of the following classes:

(1) Persons who desire to teach agriculture, nature study, and home economics, or who desire to fit themselves to supervise such instruction.

The announcements of the several groups and departments show a wide range of instruction. This instruction is adapted to the needs of teachers who desire to supplement their present knowledge of agriculture or to start in a new field. In addition to the instruction in the classroom, the University Library, the College and departmental libraries, the laboratories, greenhouses, gardens, and farms are available for use.

(2) Persons who desire to pursue investigations in agriculture. Some of the courses are advanced, and therefore suited for specialists who wish to pursue their individual study. The facilities of the College are at the disposal of persons desiring to engage in special investigations.

(3) College students in Cornell and other universities who wish to use part of the summer vacation for additional study. In the case of graduates some of the work may be counted toward an advanced degree. Undergraduates may anticipate work and thereby shorten their course, or may make up existing deficiencies. The conditions for receiving credit, and the amount that may be obtained, are stated on page 9.

(4) Students entering the University who desire to secure surplus credits at entrance, and thereby to shorten their course.

To meet these several needs the courses have been arranged in the following three groups:

I. For teachers and others engaged in elementary school work. In this group is offered lecture, recitation, conference, laboratory, and field work in nature study, elementary agriculture, school gardening, and school methods. While the courses are not restricted to the requirements of the New York State Syllabus for Elementary Schools, these requirements will be included and covered. See pages 12-13.

II. For teachers and others engaged in high school work. In this group will be given the subject matter in agriculture required in high schools and by the State Syllabus, together with special attention to methods of presentation. Conferences are provided for the discussion of classroom problems. The courses are intended especially for those wishing to start in this field and desiring acquaintance with the general field of agriculture. High school teachers having considerable preparation in agriculture may find it more advantageous to take the more specialized courses in Group III; and teachers registering in Group II will have time for some additional work in Groups I and III. See pages 13-14.

III. For teachers desiring specialized instruction, for college students, and for those desiring to pursue investigations. Courses are offered in agricultural chemistry, household chemistry, soils, biology, botany, farm crops, fruit-growing, plant pathology, plant physiology, entomology, forestry, dairy industry, animal husbandry, poultry husbandry, home economics, and meteorology. See pages 14-22.

ADMISSION, ATTENDANCE, REGISTRATION

There is no examination for admission to the Summer School in Agriculture, but applicants should have completed a high school course or the equivalent. Each person must satisfy the instructor in charge of any course that he is qualified to pursue the work of the course. Any duly registered student in the Summer School in Agriculture may visit other classes in this school than those for which he is specifically registered; but admission to the classroom is restricted to students who are duly registered in the Summer School.

All students are required to register first at the office of the University Registrar in Morrill Hall. They may register on Saturday, July 5th, between 9 a.m. and 5 p.m., or on the day of their arrival, if they reach Ithaca later than July 5th. Registration on July 5th is urged. Class exercises begin at 8 a.m., Monday, July 7th. The Registrar's Office is open from 9 a.m. to 4 p.m. every day except Saturday, when it is closed at noon. Students will report at the office of the Secretary, College of Agriculture, Room 122, Main Building, immediately after registering with the Registrar of the University.

Correspondence concerning admission and other matters relating to the Summer School should be addressed to A. R. Mann, Secretary, College of Agriculture, Cornell University, Ithaca, New York.

TUITION FEE

Tuition in the Summer School in Agriculture is free to residents of New York State and to students registered in the Graduate School in Cornell University for postgraduate work in agriculture only. Non-residents will be charged a tuition fee of $30, whether one subject or more be taken. This must be paid at the office of the Treasurer, Room 1, Morrill Hall, within five days after registration day. In case of withdrawal within five days from the first registration day, for reasons satisfactory to the Treasurer and to the Registrar, the tuition paid may be refunded and the charge cancelled. In case of withdrawal within two weeks after the first registration day, one-half the tuition may be refunded. In case of registration after the first three weeks of the session students must pay two-thirds of the full tuition fee.

LABORATORY FEES

Fees to cover the cost of materials used will be charged in a few courses and are announced in connection with those courses. Fee cards must be procured at the first class-period in each of the courses concerned. The receipted fee cards must be returned to the instructor in charge of the course within five days after the beginning of the course.

ACADEMIC CREDIT FOR WORK

In the College of Agriculture. The requirements for the degree of Bachelor of Science are residence for eight terms (four years), and the completion of one hundred and twenty hours ("points") of elective work. A student who has satisfied the entrance requirements of the College and has afterward completed in two or more summer sessions, either in the Summer School in Agriculture or in the University Summer Session, at least twelve hours of work in courses approved by the departments concerned, may be regarded as having thus satisfied one term of residence. Work done in summer sessions shall not be accepted as the equivalent of more than two terms of residence. The maximum amount of credit toward the degree of Bachelor of Science that is allowed for the work of any one summer session is seven hours.

In the Graduate School. Graduate work at Cornell University is not expressed in terms of courses or hours. A graduate of any college whose requirements for a first degree are substantially equivalent to those for the first degree at Cornell may be admitted to resident study in the Graduate School. He may be admitted to candidacy for an advanced degree upon the recommendation of the professors under whom he proposes to work. The conferring of the degree itself does not depend primarily on the completion of any prescribed number of courses or of a fixed term of residence. It involves the writing of a thesis and the passing of a special final examination. The minimum period of residence for the Master's degree is one academic year or its equivalent, and for the Doctor's degree three years.

Not all work done by a graduate student is graduate work in the strict sense of the term. Graduate work, in order to be considered as work for a degree, must be of advanced character in some field or department of knowledge.

Graduate work toward an advanced degree may be done during the Summer School under the following conditions: It must be done under the direction of a member of the Faculty of the Graduate School, after the student has entered the Graduate School, and is admitted by the Dean of the School as a candidate for an advanced degree. The residence requirement for the Master's degree may be satisfied by study during five sessions of the Summer School, or by study during one-half the academic year and in three sessions of the Summer School.

The graduate work offered in the summer of 1913 may be learned from the departmental announcements. Not all departments offer graduate work.

Any person wishing to become a candidate for an advanced degree and to study during the Summer School should write to the professor whose work he expects to take, and also to the Dean of the Graduate School, asking for a blank form of application for admission to the Graduate School. It is much better to make these arrangements before coming to Ithaca, thus avoiding delay and interruption of study after the Summer School has begun.

Certificates for work. Students in the Summer School who are not matriculated in the University may receive certificates of attendance and of work satisfactorily performed. Application for such certificate must be made before August 15th, and the applicant must leave at the office of the University Registrar a large envelope stamped and bearing his home address. The certificate will then be forwarded by mail.

COST OF LIVING

The cost of board and furnished room in Ithaca during the Summer School runs from $5.50 a week upward. In some cases the cost has been reduced to $5, or even $4.50, but it is not safe to count on less than $5.

The price of a single furnished room may be as low as $1 a week. The prices advance with the size and location of the rooms.

Rooms are engaged with the understanding that they will be occupied for the entire session, unless otherwise agreed on by both parties. Table board is usually engaged by the week, or, if so stated, by the day.

The price of table board runs from $4 and $4.50 in boarding houses, to $7 and $10 at the hotels.

The University has one residence hall, the Sage College. This will, as heretofore, be opened for women throughout the Summer School. As the great majority of the persons living in this building are attending the University for serious work, it is necessary that the rooms and halls should be quiet during the hours of rest. Persons unwilling to conform to reasonable regulations for securing this quiet are not wanted in the building. The price of rooms in Sage College is $1.25 to $5.50 a week, according to location, and the price of table board is $5. The capacity of the building is usually engaged in advance, and early application is therefore advisable.

Application should be made to the Manager of Sage College, Ithaca, New York. Every application for a room to be reserved must be accompanied by a deposit of $5, otherwise the application is not registered. The amount of this deposit is deducted from the rent if the room assigned be occupied by the applicant; it may be refunded if the applicant gives formal notice to the manager on or before June 15th that she desires for good reasons to withdraw the application altogether.

Without permission from the Director of the University Summer Session no one will be allowed to room in Sage College during the summer unless registered in the Summer School in Agriculture or the University Summer Session. Persons desiring assistance in engaging comfortable rooming and boarding places outside of Sage College will, on application to the Secretary, College of Agriculture, after June 15th, be furnished with a list of approved places.

The whole expense of attendance at the Summer School, not including laboratory fees, may be estimated at $65 to $85.

THE LIBRARIES

The University Library is open on week days from 9 a.m. to 10 p.m., except Saturday, when it closes at 1 p.m. In this are housed the main library, containing about four hundred thousand volumes, and most of the seminary and special libraries. The main reading room affords accommodations for over two hundred readers and contains a selected library of over eight thousand volumes of reference works. Adjacent to it is the periodical room, in which are kept the current numbers of about five hundred journals in various fields of knowledge. These rooms are open to all students. Students properly qualified are allowed the use of the seminary rooms and of the books in them. The main collection is primarily a library of reference for use in the building. Students are allowed, however, to a limited extent to take out books for home use. Persons wishing this privilege must make a deposit of $5, which will be refunded on the return of all books taken out.

The Library of the College of Agriculture, on the first floor of the main building, is open on week days from 9 a.m. to 5 p.m., except Saturday, when it closes at 1 p.m. In it will be found a large collection of bulletins and reports of experiment stations, reference books on agriculture and country life, agricultural periodicals, and the like. The entomological library, housed in the Department of Entomology on the fourth floor of the main building, is one of the most complete of its kind in the United States. Nearly all the departments in which instruction is given have well-selected departmental libraries.

LECTURES, MUSICAL RECITALS, EXCURSIONS

In addition to the regular classroom work there will be public lectures on topics of general interest on Monday evenings. Besides these there are weekly lectures of general interest in connection with the various departments. Notice of these will be given in the University Calendar each week.

Musical recitals will be given on Tuesday and Thursday evenings in the Sage Chapel.

On Wednesday evenings special lectures on agricultural or country-life subjects, or informal assemblies of all students registered in the Summer School in Agriculture, will be arranged. Notice of these will be given from week to week.

In connection with the work of several departments, excursions are made to points of interest. Most of these are open to members of the Summer School. Notice of them is given from week to week.

An informal reception of all summer students will be held on some evening at the beginning of the summer session. This, it is hoped, will assist students in the Summer Session and the Summer School in becoming acquainted with the members of the staff of instruction and with one another.

THE CITY AND THE UNIVERSITY

Ithaca is situated in Tompkins County at the head of Cayuga Lake. It is a city of about fifteen thousand inhabitants. Cornell University stands on a plateau about four hundred feet above the lake. The officers of instruction and administration of the University number about 700. The campus and farms cover nearly 1200 acres.

The main buildings of the University are over thirty in number, providing quarters for the several colleges of the University. These are the Graduate School and the colleges of Arts and Sciences, Law, Medicine, Agriculture, Veterinary Medicine, Architecture, Civil Engineering, and Mechanical Engineering.

The New York State College of Agriculture at Cornell University occupies new buildings erected by the State. These buildings are large and well equipped, and afford an attractive and comfortable home for the College.

RAILROAD ROUTES AND RATES

Ithaca is reached by either the Lehigh Valley or the Lackawanna Railroad. A branch of the latter leaves the main line at Owego. Through trains run from New York and Buffalo on the Lehigh, and through sleeping cars run daily from New York on both roads. From Philadelphia, Baltimore, Washington, and the South, via the Baltimore & Ohio, the Philadelphia & Reading connects with the Lehigh at Bethlehem. On the Lehigh, through trains for Ithaca connect with the New York Central at Auburn, and with the Pennsylvania (Northern Central) and the Erie at Elmira.

From nearly all important points in the Middle and Atlantic Coast States summer excursion tickets may be purchased to Ithaca. From Central and Western States it is generally possible to buy excursion tickets to Niagara Falls, in case an excursion rate to Ithaca is not available.

At the time this pamphlet goes to press it is not possible to give specific rates. Persons interested should, some time in advance of their departure, make inquiry of the railroad agent at their home town. If full information cannot be obtained in this way, inquiries may be addressed to the Secretary of the College of Agriculture.

COURSES OF INSTRUCTION

The courses of instruction have been arranged in the following three groups as a matter of convenience and to serve in some measure as a guide to students in arranging schedules of studies best adapted to their individual needs. Students may elect from any or all of the groups courses that they are qualified to pursue.

GROUP I. COURSES PRIMARILY FOR TEACHERS IN ELEMENTARY SCHOOLS

The following courses are designed particularly to meet the needs of teachers and supervisors of nature study, school gardening, and agriculture in the grades:

A. **General Nature Study.** Credit, two hours. Lectures, M W, 9. Main 302. Field and laboratory observations, T Th S, 10–12.30. Main 302. Mrs. Comstock and Assistant Professor Embody.

The field and laboratory work will include individual observations concerning the life-histories and habits of various types of wild and domesticated animals and plants. Special attention will be given to the honeybee and other garden insects, together with their relations to the common garden plants.

The lectures, in addition to supplementing and elucidating the field and laboratory work, will present methods for the construction and maintenance of breeding-cages and aquaria, and the literature of nature study.

B. **Natural History of the Farm.** Credit, one hour. Lecture, F, 9. Dairy 222. Field work, sec. A, T Th, 2–5; sec. B, W F, 2–5. Assistant Professor Embody.

This is primarily a field course, treating principally of the wild inhabitants of the fields, woods, marshes, and streams of the farm. Wild organisms will be compared with domesticated or cultivated ones and the availability of certain wild forms for cultivation will be pointed out.

The following topics, among others, will be studied: wild fruits, wild roots, wild cereals, deciduous trees, evergreens, pasture plants and their fitness for pasture conditions, wild birds, wild mammals, and fishes and other inhabitants of the farm stream.

Each student will be required to do a considerable part of the work individually. Field reports must be handed in weekly and these will be carefully graded.

C. Agriculture for Elementary Schools. Credit, two hours. Open to teachers; other persons must obtain special permission before registering for the course. Lectures, T Th, 9. Poultry Auditorium 375. Laboratory, M W, 10–12.30. Seminar, F, 10–12.30. Farm Management Laboratory, Poultry Building. Professor WARREN, Mr. ———, and Mr. ———.

Lectures, laboratory practice, and discussions on subject matter of agriculture for elementary schools, methods of teaching, and correlation of agriculture with other subjects.

D. The School Garden. Credit, one hour. Lectures, M W, 9. Conference, F, 9. Rural Schoolhouse. Miss MCCLOSKEY and Mr. HUNN.

This course is designed for teachers in elementary grades. Some of the educational possibilities in gardening will be presented and methods given for conducting the work in rural, village, and city schools. There will be discussions of garden plans and methods in connection with a garden prepared for the demonstration of desirable school work in this subject. Home gardens, experimental gardens, window boxes, and simple plant study will be considered.

E. Practical Gardening for Teachers. Credit, one hour. Lecture, F, 8. Main 232. Laboratory, F, 2–4.30, S, 8–10.30. Main 232 and the field. Mr. WORK and Mr. HUNN.

Lectures, laboratories, and conferences dealing with the school garden. The site, the equipment, the soil and its improvement, planning the garden, seed and seed sowing, other methods of plant propagation, plants and plant growing, transplanting, cultivating, watering, pests and pest control, harvesting. The plants of the garden, their habits, requirements, and culture. In the laboratory work, attention will be given to methods of teaching garden operations as well as to the operations themselves.

F. The School. Credit, two hours. Lectures and conferences, daily except S, 8; repeated, daily except S, 11, if registration requires it. Rural Schoolhouse. Miss MCCLOSKEY and Mr. TUTTLE.

This course will suggest methods of instruction in elementary agriculture and nature study, taking as a basis the work outlined in the New York State Syllabus for 1913–14. Simple apparatus to be used in teaching country-life subjects will be shown and discussed. Other subjects for lectures and discussions will be as follows: field work; natural history collections; neighborhood studies; the school and the home; agricultural contests; the county fair; small school exhibits; additions to the school library; the school grounds; Arbor Day; Corn Day; and similar topics of interest to grade teachers, training-class teachers, district superintendents, and all persons interested in introducing country-life subjects into schools.

GROUP II. COURSES PRIMARILY FOR TEACHERS IN HIGH SCHOOLS

In this group are given general introductory courses for persons desiring to engage in the teaching of agriculture in the high school. More advanced and specialized courses are offered in Group III; but it is recommended that persons having little knowledge of agriculture take courses in Group II the first year. Persons taking any of the courses in this group may elect additional courses from either Group I or Group III.

B. Agriculture for High Schools. Credit, three hours. Open to teachers; other persons must obtain special permission before registering. Lectures, M W F, 9. Poultry Auditorium 375. Laboratory and seminar, sec. A, daily except S, 2–4.30; sec. B, daily except S, 2–4.30. A third section will be formed if necessary. Farm Management Laboratory, Poultry Building. One of the laboratory periods each week will be a seminar. Professor WARREN, Mr. ———, and Mr. ———.

Lectures, laboratory practice, and discussions on agriculture for high schools. Four of the laboratory periods will ordinarily be devoted to the study of some of the more important principles of agriculture. One laboratory period will be devoted to a seminar for discussion of problems that arise in teaching agriculture. Throughout the course, methods of instruction will be considered along with subject matter.

Owing to the fact that there will be some duplication of work for which credit has already been received, juniors and seniors in the College of Agriculture who complete the work of this course will be given only two hours credit.

A. General Biology. See page 15.

A. Structural and Physiological Botany. See page 20.

B. Identification of Mushrooms and Disease-Inducing Fungi. See page 20.

B. Dairy Industry. See page 16.

B. Forests and Forestry. See page 17.

A. General Fruit-Growing. See page 20.

C. Soils. See page 22.

Home Economics. See page 18.

Education. The following courses in education, description of which will be found in the announcement of the University Summer Session, are open to students registered in the Summer School in Agriculture on the payment of thirty dollars tuition charge: A, Principles of Education; B, History of Education; C, Educational Psychology; E, Mental and Physical Tests of School Children; F, Elementary Education; G, School Organization, Administration, Supervision, and Management; H, Industrial Education.

GROUP III. SPECIALIZED COLLEGE COURSES

ANIMAL HUSBANDRY

A. Principles and Practice of Feeding Animals. Credit, two hours. Lectures, M W F, 10. Practice, T Th, 10–12.30. Animal Husbandry Building. Assistant Professor SAVAGE.

The general principles of animal nutrition, based on Jordan's Principles of Human Nutrition as a text. The discussion of these principles will occupy most of the time given to lectures. The practice of feeding animals, based on Henry's Feeds and Feeding as a text. The discussion of the practice of feeding horses, cattle, sheep, and swine will occupy most of the time given to laboratory work; the study of feeding standards; the study of about forty home-grown and commercial feeds; the formulation of rations, etc.

B. Principles of Animal Breeding, and Elementary Judging. Credit, three hours. Lectures, daily except S, 9. Laboratory, T Th, 2–4.30. Animal Husbandry Building. Assistant Professor HARPER.

A general discussion of the principles of heredity as applied to the breeding of animals, with a study of animal form; origin and formation of breeds; crossing and grading, with an outline of the methods of registration and the study of records and pedigrees. Demonstrations, essays, and reports will be required in addition to the lectures.

The laboratory work will give actual contact with animals, and methods of scoring and judging. Types and several breeds, particularly of dairy cattle, will be illustrated.

BIOLOGY

A. General Biology. Credit, three hours. Lectures, daily except S, 11, Main 392. Laboratory and field work, sec. A, M W F, 2–4.30; sec. B, T Th, 2–4.30, S, 8–10.30. Main 302. Assistant Professor JOHANNSEN and Mr. ———.

This is an elementary course designed to acquaint the general student and the prospective teacher with the principal ideas of biology through selected practical studies of the phenomena on which biological principles are based. The chief types of both the plant and animal series are studied in logical sequence, particular attention being paid in both lecture and laboratory to such topics as the interdependence of organisms, the simpler organisms, organization and phylogeny, heredity and variation, natural selection and adaptation, segregation and mutation, the life cycle, metamorphosis and regeneration, and the responsive life of organisms. Laboratory fee, $2.50.

CHEMISTRY

A. Agricultural Chemistry. Credit, three hours. Prerequisite Chemistry 1, or its equivalent. Lectures, daily except S, 8. Morse Lecture Room 1. Recitations, M W F, 9. Morse Hall. Professor CAVANAUGH.

A general course treating of the relations of chemistry to agriculture. The following are among the subjects discussed: the chemical composition of agricultural plants and plant by-products; the chemical composition of soils; some chemical relations between the organic and the inorganic matter of soils; the sources, preparation, and manufacture of the materials used in fertilizers; the chemical relations of lime to soils; the chemistry of insecticides and fungicides.

B. Agricultural Chemistry. Credit, one or two hours. Prerequisite Chemistry 1 and 6, or the equivalent. By appointment, daily except S, 9–12 and 2–5. Quantitative Laboratory, Morse Hall. Professor CAVANAUGH and Mr. RICE.

A laboratory course designed to accompany course A. Laboratory deposit, $10 or $15, according to work taken.

C. Household Chemistry. Credit, two hours. Prerequisite Chemistry 1 and 6, or the equivalent. Lectures, daily except S, 10. Morse Lecture Room 3. Professor CAVANAUGH.

This course is designed especially for students in home economics. It treats of the chemistry of foods, beverages, baking chemicals, preservatives, and detergents.

D. Household Chemistry, Laboratory Course. Credit, two or three hours. By appointment, daily except S, 8–10 and 2–5. Quantitative Laboratory, Morse Hall. Professor CAVANAUGH and Mr. RICE.

This course is designed to accompany course C.

DAIRY INDUSTRY

A. Milk Composition and Tests. Credit, two hours. Lectures, M W F, 8. Dairy 222. Laboratory, M W F, 2–4.30. Dairy 232. Professor TROY and Mr. MCINERNEY.

This is equivalent to course 1 of the regular university course. The topics considered are the secretion and composition of milk, sampling, the use of the lactometer, the Babcock test for fat in milk, cream, and other dairy products, acid tests, moisture test, salt test, tests for preservatives and adulterations. Laboratory deposit ($3) part returnable.

B. Dairy Industry. Five hours. No university credit. Lectures, T Th, 8. Dairy 222. Laboratory, M W F, 10–1. Dairy 122. Professors STOCKING and ROSS; Messrs. FISK, MCINERNEY, and PICKERILL.

This is a general course in dairy work covering the outline as given in the State Syllabus. This course should be of value to teachers of dairy work in high schools. The course includes lectures and laboratory work on the following topics: nature of bacteria and their relation to dairy products; sources of bacterial contamination of milk and methods of prevention; pasteurization; use of bacteria starters; the Babcock test for fat in milk and milk products; the lactometer and its use; acid test; sampling; composition of milk; milk preservatives and adulterations; standardization of milk; use of score cards for dairy farms and dairy products; dairy buildings, equipment, and utensils; handling of market milk; action of rennet; making of cottage cheese. Laboratory deposit ($3) part returnable.

ENTOMOLOGY

The following courses will be continued throughout the six weeks of the Summer School. Students qualified to do advanced work will be granted the facilities of the laboratories, field stations, and library, after the close of the regular session. Members of the staff in residence during this period will be glad to consult with and aid such students.

Laboratory fees, will be charged in these courses, varying with the nature of materials required, from $.50 to $1.50 per hour of academic credit.

A. General Entomology. Credit, two or more hours. Lectures, daily except S, 9. Main 392. Laboratory and field work, to the extent of one or more hours, may be elected in course B. Hours by appointment. Main 391. Miss STRYKE.

An introductory course dealing with the biology, habits, economic importance, and relationships of insects.

B. Laboratory Course in the Morphology and Classification of Insects. Credit, two or more hours. Laboratory open daily except S, 8–5. Main 391. Professor W. A. Riley and Miss Stryke.

Study of the external anatomy of typical insect forms; the collecting, mounting, and classifying of representatives of all the orders and the chief families of insects. While the systematic work will give a general survey of the field, each student may direct his energies toward the collecting of any group in which he is particularly interested.

C. Morphology and Development of Insects. Credit, two hours. Lectures, daily except S, 8. Main 392. Professor W. A. Riley.

A lecture course designed for advanced students in entomology and those specializing in zoology.

D. Insects and Diseases. Credit, one hour. Lectures and demonstrations, M W F, 12. Main 392. Professor W. A. Riley.

A consideration of insects and their allies as the cause, and more especially, as the conveyors and disseminators of diseases of man and the higher animals. The object of the course is to afford a general survey of the field and to put the student in touch with the discoveries and theories which in very recent years have become important factors in the fight for public health and in the case of certain diseases have completely revolutionized the methods of control. There will be abundant opportunity for laboratory work for those desiring special study along these lines.

E. Research. Opportunities will be offered for advanced work and research in various phases of entomology. Properly qualified students registered as candidates for advanced degrees may elect thesis work under any member of the Department who is in residence during the summer.

Seminary. The work of an entomological seminary is conducted by the Jugatae, an entomological club that meets for the discussion of current literature and of the results of investigations.

FARM CROPS

A. Farm Crops. Credit, three hours. Lectures, daily, 10. Laboratory, M W, 2–4.30. Agronomy 202. Professor Montgomery and Mr. ———.

A course covering the principal cereal and forage crops. The subject matter presented will be selected especially to meet the needs of teachers of agriculture in high schools. Laboratory fee, $2.

FORESTRY

A. Care of the Woodlot. Credit, two hours. Lectures, M W F, 9. Home Economics Building 100. Field work, M W, 2–4.30. Home Economics Building 370. Professor Mulford.

A course dealing with the woodlot as deserving and repaying proper care such as is given the other crops on the farm. Topics to be considered include forest planting, sowing, and nursery work; reproducing the forest without planting or sowing; care of the crop during growth, including thinning, protection from fire and other enemies; measuring the amount of timber in the woodlot. Laboratory fee, $.50.

B. Forests and Forestry. Credit, two hours. Lectures, M W F, 8. Home Economics Building 100. Seminar, T, 8. Home Economics Building 370. Field work, F, 2–4.30. Home Economics Building 370. Professor Mulford.

A course designed primarily for teachers. The topics to be considered will include the aims and general methods of forestry; the usefulness of forests to the nation, including the influence exerted by forests on climate and stream-flow; brief description of the principal forest regions of the United States; the life-history of a forest; identification of the common trees occurring in the northeastern United States; what is being done in forestry by the nation, by states, and by other agents; forestry in Europe. Laboratory fee, $.50.

HOME ECONOMICS

The work is intended for persons desiring to teach, but is suited to others desiring to study the principles of home-making.

A. Foods. Credit, four hours. Lectures and recitations, daily except S, 11. Home Economics Building 100. Laboratory practice, daily except S, 2–5. Home Economics Laboratory 200. Written review for those wishing credit in this course, S, 11. Miss Browning, Miss Knowlton, and Miss Betts.

A course for establishing a fundamental knowledge of foods. The lectures will include a discussion of the sources, composition, and characteristics of foodstuffs; principles governing the selection of foods and methods of preparing them; food preparation and preservation; table-setting and serving; comparative nutritive values and costs of various foods. The laboratory work will follow the lectures closely and will consist of experiments in determining the characteristics of foodstuffs as these relate to the preparation of food and to practical problems of cookery. Laboratory fee, $5.

B. Human Nutrition. Credit, three hours. Lectures and recitations, daily except S, 12. Home Economics Building 100. Laboratory practice, M W F, 2–5. Home Economics Laboratory 300. Written review for those wishing credit in the course, S, 12. Professor Rose and Miss Browning.

This course will include discussion of the fundamental principles of nutrition as these apply to the human being; the practical means of applying scientific principles in planning dietaries; special problems of nutrition, as the feeding of infants. The laboratory work will consist of exercises in determining the comparative cost and nutritive value of various foods; in planning and judging various types of dietaries; in preparing typical meals. Open only to students who have had course A or its equivalent. Laboratory fee, $4.

C. Household Management. Credit, two hours. Lectures, M W F, 8. Home Economics Building 105. Laboratory, T Th, 8–11. Home Economics Laboratory 400. Written review for those desiring credit in the course, S, 8. Professor Van Rensselaer.

The course is both theoretical and practical. Lectures will be division of income, household accounts, factors in cost of living from the housekeeper's standpoint, domestic service, household equipment, and labor-saving. Laboratory practice will consist of experimental work in cleaning, use of equipment, and general management of the house. Laboratory fee, $1.

D. Household Sanitation. Credit, one hour. Lectures and recitations, M W F, 10. Home Economics Building 100. Miss KNOWLTON.

Household bacteriology; cleanliness of soil, air, water, food; disposal of waste; insect pests, infection, immunity, methods of disinfection; good housekeeping in relation to public health; healthful living to promote efficiency; physical exercise and rest.

E. Extension in Home Economics. Credit, one hour. Lectures and laboratory, T Th, 2–5. Home Economics Building 250. Professor VAN RENSSELAER.

Principles of extension work with special reference to rural communities; organization; material to be presented; manner of presentation; speaking; writing. Practice problems in rural communities. Laboratory fee, $2.

F. Sewing and Millinery. Credit, four hours. Lectures, daily except S, 10. Home Economics Building 305. Laboratory practice, daily except S, 8–10. Home Economics Laboratory 300.

A course designed for those who are to teach in the public schools. It involves a study of the economic standards for the production and selection of clothing; hygiene of clothing; principles of art in relation to dress; instruction in drafting, cutting, and plain and machine sewing. Laboratory fee ($5), part returnable.

G. School Methods in Home Economics. Credit, one hour. Lectures and conferences, M W F, 9. Home Economics Building 105. Professors VAN RENSSELAER and ROSE; and Miss BROWNING.

Relation of home economics to education; place of home economics in the school curriculum; preparation for teaching; relation of home economics to physical and social sciences; art; literature of home economics; method of presentation; equipment; relation to life of the community.

Household Chemistry. See page 15.

METEOROLOGY AND CLIMATOLOGY

A. Meteorology and Climatology. Credit, one hour. Lectures and field observations, M W F, 11. Geological Lecture Room. Professor W. M. WILSON.

This course is designed to meet the needs of teachers of physical geography and other persons desiring a general knowledge of the subject. The course will offer suggestions as to subjects of meteorological study that come within the scope of facilities afforded by public schools, and where and how meteorological and climatological data may be obtained for school use; acquaint the student with the general circulation of the atmosphere; the development, progression, and conditions that attend cyclones, hurricanes, tornadoes, and special storms; the construction of weather maps and climatological charts; practical weather forecasting from weather maps and from local observations; use and care of meteorological instruments; general and special climatology and its relation to agriculture. Special attention will be given to the practical application of the principles of meteorology as exemplified by the work of the United States Weather Bureau and other similar organizations.

PLANT PATHOLOGY

A. Plant Pathology. Credit, three hours. Prerequisite elementary botany 5 or 6 hours. Recitations or lectures, M W F, 8. Agronomy 192. Laboratory, daily except S, 2–4.30. Agronomy 152. Dr. Fitzpatrick and Mr. Chupp.

A fundamental course in plant pathology treating of the common diseases of cultivated plants; their nature, cause, and control. It is a prerequisite for all other courses in plant pathology. Laboratory fee, $4.50, plus a breakage deposit of $2.

B. Identification of Mushrooms and Disease-Inducing Fungi. Credit, one hour. Lecture, T, 8. Agronomy 302. Laboratory, T Th, 9–12. Agronomy 152. Dr. Fitzpatrick and Mr. Chupp.

Especially designed for teachers who desire a working knowledge of the common mushrooms and disease-inducing fungi that occur in this region. This work will consist very largely of collecting trips for a part of the morning, followed by laboratory study and identification of the material collected. Teachers will find the facts and material thus collected of special service in nature study teaching and in the teaching of agriculture in high schools. Laboratory fee, $1.50, plus a breakage deposit of $2.

PLANT PHYSIOLOGY

A. Structural and Physiological Botany. Credit, two hours. Lectures, M W, 10. Agronomy 192. Laboratory, T Th S, 10–12.30. Agronomy 21. Assistant Professor Knudson and Dr. Hill.

A course primarily for teachers of agriculture. It will consider the external and internal structure of plants in relation to function. The topics include, among others, absorption, conduction, water loss, mineral nutrition, synthesis of food, digestion, respiration, growth and reproduction, and the organs and tissues concerned in the processes. Laboratory fee, $3.

B. General Plant Physiology. Credit, four hours. Prerequisite all freshman work or its equivalent, and general botany. Lectures, daily except S, 9. Agronomy 192. Laboratory, daily except S, 10–12.30. Agronomy 21. Assistant Professor Knudson and Dr. Hill.

Lectures, recitations, laboratory work, reports, and occasional field studies. Topics include absorption, conduction, transpiration, metabolism, relation to environment, growth, reproduction, and propagative processes. Laboratory fee, $5.

C. Special Problems in Plant Physiology. Special work in certain phases of physiology, including ecology and fermentation. Admission to work, and hours arranged only by appointment. Assistant Professor Knudson.

POMOLOGY

A. General Fruit-Growing. Credit, three hours. Prerequisite Botany 1 and 2, or the equivalent. Lectures, daily except S, 11. Recitations, T Th, 9. Main 292. Laboratory, S, 8–10.30. Main 202. Professor Wilson and Mr. Anthony.

A study of the methods of propagation and early care of commercial fruits, including the growing of seedlings, cuttings, and layers; the principles of budding, grafting, pruning, and planting; the soils, varieties, and planting plans for the orchard; the cultivation, cover-crops, fertilization, spraying, pruning, and thinning, as practiced in orchard management; the picking, grading, packing, storing, and marketing of fruit. This course considers the apple, pear, quince, cherry, plum, apricot, peach, and the nuts.

B. Small Fruits. Credit, one hour. Lectures, M W, 9. Recitation, F, 9. Main 292. Professor WILSON.

A course which considers the grape, raspberry, blackberry, dewberry, currant, gooseberry, and strawberry. The topics discussed are soils, varieties, propagation, planting, culture, picking, grading, packing, and marketing.

C. Advanced Pomology. Credit, one hour. Prerequisite Botany 1 and 2 and Pomology A, or the equivalent. Lectures, T Th, 10. Main 292. Laboratory, T, 2–4.30. Main 202. Mr. ANTHONY.

The course includes a comprehensive study of varieties; the judging of fruits; the preparation of planting and working plans; a study of the characters and botanical relationships of the fruits of the United States. Each student is required to collect and mount a number of varieties and species. A trip to Geneva will occupy one afternoon or a Saturday sometime during the course.

POULTRY HUSBANDRY

A. Poultry Care and Management. Credit, two hours. Lectures, daily except S, 12. Poultry Auditorium 375. Professor RICE.

Subjects to be discussed at the lectures include incubating and brooding, principles of poultry-breeding, the selection and business organization of the poultry farm.

B. Feeding Poultry. Credit, one hour. Lectures, M W, 10. Poultry Auditorium 375. Laboratory, M or W, 2–4.30. Poultry Laboratory 300. Professor RICE and Mr. KENT.

Subjects discussed at the lectures are anatomy, physiology of reproduction and digestion, principles and practice of feeding for egg-production, fattening, and rearing. The subjects to be presented in laboratories are anatomy of poultry, study of the egg, study of feeds, making rations, etc. Laboratory fee, $1.

C. The Breeds, Judging, and Poultry-House Construction. Credit, one hour. Lectures, T Th, 10. Poultry Auditorium 375. Laboratory, T or Th, 2–4.30. Poultry Laboratory 300. Assistant Professor ROGERS and Mr. KENT.

A discussion of the general characteristics of the breeds of poultry; nomenclature; types; feather markings; judging for constitutional vigor, utility, and standard points; principles of poultry-house construction and design; building materials; building construction; laying out foundations; concrete construction; estimates; visits to poultry buildings.

D. Marketing Poultry and Poultry Products. Credit, one hour. Lectures, F, 10, S, 9. Poultry Auditorium 375. Laboratory, F, 2–4.30, or S, 10.30–1. Poultry Laboratory 300. Mr. BENJAMIN and Mr. KENT.

The subjects discussed at the lectures and applied at the laboratories are: cleaning, testing, grading, packing, and marketing eggs; killing, picking, packing, and marketing poultry; judging eggs and dressed poultry; preservation and storage of eggs and poultry; preparation of poultry for the table, including shaping, drawing, trussing, deboning, and carving.

SOIL TECHNOLOGY

A. Principles of Soil Management. Credit, three hours. Prerequisite Chemistry 1 and Geology 1, or the equivalent. Lectures, daily except S, 12. Main 292. Laboratory, M W F, 2–4.30, or T Th, 2–4.30, and S, 8–10.30. Before choosing laboratory periods, Assistant Professor Buckman must be consulted. Agronomy 42. Assistant Professor BUCKMAN and Mr. KLEIN.

A comprehensive course in soils, dealing with their fundamental physical, chemical, and biological properties. Particular attention is given to soil management in relation to crop production. The laboratory is supplemented and correlated with the lecture work by demonstrations and short lectures. Laboratory deposit, $3.

B. Manures and Fertilizers. Credit, one hour. Prerequisite Soils 1 and Chemistry 85. Lectures, M W F, 8. Main 292. Assistant Professor BUCKMAN and Mr. KLEIN.

This course deals with the composition, handling, and use of barnyard and green manures, and the utilization of commercial fertilizers and soil amendments. A brief study of experimental work will be a phase of the lectures.

C. Soils. Three hours. No university credit. Lectures, T Th, 9. Round-table for discussion and demonstration, S, 9. Auditorium, Main Building. Assistant Professor BUCKMAN and Mr. KLEIN.

A practical, fundamental course in soils. The subject will be handled with special reference to the needs of those expecting to teach soils in secondary schools. The lectures will include a discussion of the formation and classification of soils, tilth, soil moisture, soil biology, soil amendments, manures and fertilizers, and practical soil management. The round-table once a week will give opportunity for questions and practical discussions as to methods of demonstration.

SCHOOL FOR LEADERSHIP IN COUNTRY LIFE

To be held at the New York State College of Agriculture, June 24 to July 4, 1913, inclusive.

A training school in rural social science open to all persons who are interested, and more especially to those who occupy positions of leadership and influence in the open country. Special invitation is given to rural school principals and teachers, rural pastors, secretaries of rural Young Men's and Young Women's Christian Associations, officers of men's brotherhoods, boy scout masters, editors, officers of granges, institute lecturers, and other active rural workers.

The courses are graded to meet the needs of former attendants on the School for Leadership and other persons having some preparation in this field.

(1) Forenoon periods. (a) For first-year students courses are offered in the rural mind; the study of human nature; the psychology of leadership; rural economic conditions; economic ideals of the countryman; principles of rural sociology; rural social conditions; and a special course in leadership for the farm woman and the farm girl.

(b) The second-year courses include a study of business organization and co-operation; economic thrift and wastefulness of the farmer and of rural social institutions; social function of rural institutions; cooperation and federation of rural social agencies; the pedagogy of leadership; group organization; rural health; rural play and recreation; rural personal ideals; the rural family; the farm woman; the rural survey; the community program; education extension work in agriculture.

(2) The afternoon periods are free from required work. Definite provision is made for play and games, field trips, tramps, inspection of campus, college, and farms, etc. Opportunity is provided for demonstrations in rural recreation, for informal group conferences, personal consultation with members of the staff, and the like. The members of the staff are available for consultation at all times during the School.

(3) The evening periods combine entertainment features with illustrated addresses on leading country-life questions and institutions.

Exhibits are a special feature; exhibits to illustrate the subject matter of the courses and other matters of general interest, as types of bulletins, reading and correspondence courses, farm journals, book-shelf, rural recreation equipment, survey forms, and the like.

Expenses. There is no registration fee. Persons in attendance will pay their own traveling and entertainment expenses.

Information. For complete programs and detailed information concerning the conference and arrangements for living while at Ithaca, address A. R. Mann, Secretary, College of Agriculture, Cornell University, Ithaca, New York.

OFFICIAL PUBLICATIONS OF CORNELL UNIVERSITY

Issued at Ithaca, N. Y., monthly from July to November inclusive, and semimonthly from December to June inclusive.

[Entered as second-class matter, August 31, 1910, at the post office at Ithaca, N. Y., under the Act of July 16, 1894.]

These publications include

Catalogue Number (containing lists of officers and students), price 25 cents,

Book of Views, price 25 cents,

Directory of Faculty and Students, Second Term, 1912–13, price 10 cents, and the following informational publications, any one of which will be sent gratis and post-free on request. The date of the last edition of each publication is given after the title.

General Circular of Information for Prospective Students, December 15, 1912.

Announcement of the College or Arts and Sciences, June 15, 1912.

Announcement of the Sibley College of Mechanical Engineering and the Mechanic Arts, January 1, 1913.

Announcement of the College of Civil Engineering, February 15, 1913.

Announcement of the College of Law, May 15, 1912.

Announcement of the College of Architecture, March 15, 1912.

Announcement of the New York State College of Agriculture, August 1, 1912.

Announcement of the Winter Courses in the College of Agriculture, September 1, 1912.

Announcement of the Summer School in Agriculture, July 1, 1912.

Announcement of the New York State Veterinary College, March 1, 1913.

Announcement of the Graduate School, January 15, 1913.

Announcement of the Summer Session, March 15, 1913.

Announcement of the Department of Forestry, November 1, 1912.

Annual Report of the President, December 1, 1912.

Pamphlets on scholarships, fellowships, and prizes, samples of entrance and scholarship examination papers, special departmental announcements, etc.

Correspondence concerning the publications of the University should be addressed to

The Secretary of Cornell University,
Ithaca, New York.

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OFFICIAL PUBLICATIONS OF CORNELL UNIVERSITY

VOLUME V NUMBER 9

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OF THE
UNIVERSITY OF ILLINOIS

NEW YORK STATE
COLLEGE OF AGRICULTURE
ANNOUNCEMENT OF THE SUMMER TERM
1914

APRIL 15, 1914
PUBLISHED BY CORNELL UNIVERSITY
ITHACA, NEW YORK

CALENDAR

Summer Term

June 8,	Monday,	Registration of all students.
June 9,	Tuesday,	Instruction begins in all courses.
June 17,	Wednesday,	Forty-sixth Annual Commencement. Half holiday.
July 4,	Saturday,	Holiday.
Sept. 23,	Wednesday,	Instruction ends.

Summer Session

July 6,	Monday,	Summer Session begins.
Aug. 14,	Friday,	Summer Session ends.

Fall Term, 1914–15

Sept. 11,	Friday,	Entrance examinations begin.
Sept. 21–22,	Monday–Tuesday,	Registration of new students.
Sept. 23,	Wednesday,	Registration of old students.
Sept. 24,	Thursday,	Instruction begins.

NEW YORK STATE COLLEGE OF AGRICULTURE

FACULTY

Jacob Gould Schurman, A.M., D.Sc., LL.D., President of the University.

William Alonzo Stocking, jr., M.S.A., Acting Director of the College of Agriculture and Professor of Dairy Industry.

Isaac Phillips Roberts, M.Agr., Professor of Agriculture, Emeritus.

John Henry Comstock, B.S., Professor of Entomology and General Invertebrate Zoology.

Henry Hiram Wing, M.S. in Agr., Professor of Animal Husbandry.

Thomas Lyttleton Lyon, Ph.D., Professor of Soil Technology.

John Lemuel Stone, B.Agr., Professor of Farm Practice.

James Edward Rice, B.S.A., Professor of Poultry Husbandry.

George Walter Cavanaugh, B.S., Professor of Chemistry in its Relations to Agriculture.

George Nieman Lauman, B.S.A., Professor of Rural Economy.

Herbert Hice Whetzel, A.B., M.A., Professor of Plant Pathology.

Elmer O. Fippin, B.S.A., Professor of Soil Technology.

George Frederick Warren, Ph.D., Professor of Farm Management.

Charles Scoon Wilson, A.B., M.S.A., Professor of Pomology.

Charles Henry Tuck, A.B., Professor of Extension Teaching.

Albert Russell Mann, B.S.A., Secretary to the College of Agriculture, Registrar, and Professor of Agricultural Editing.

Wilford Murray Wilson, M.D., Professor of Meteorology.

Walter Mulford, B.S.A., F.E., Professor of Forestry.

James George Needham, Ph.D., Professor of General Biology, Limnology, and Nature Study.

Bryant Fleming, B.S.A., Professor of Landscape Art.

Harry Houser Love, Ph.D., Professor of Plant Breeding Investigations.

Arthur Witter Gilbert, Ph.D., Professor of Plant Breeding.

Donald Reddick, Ph.D., Professor of Plant Pathology.

Edward Gerrard Montgomery, M.A., Professor of Farm Crops.

———— ————, Professor of Rural Education.

Flora Rose, B.S., M.A., Professor of Home Economics.

Martha Van Rensselaer, A.B., Professor of Home Economics.

William Albert Riley, Ph.D., Professor of Insect Morphology and Parasitology.

James Adrian Bizzell, Ph.D., Professor of Soil Technology.

Glenn Washington Herrick, B.S.A., Professor of Economic Entomology.

Howard Wait Riley, M.E., Professor of Farm Mechanics.

Harold Ellis Ross, M.S.A., Professor of Dairy Industry.

Hugh Charles Troy, B.S.A., Professor of Dairy Industry.

Samuel Newton Spring, B.A., M.F., Professor of Forestry.

Karl McKay Wiegand, Ph.D., Professor of Botany.

William Henry Chandler, B.S. in Agr., M.S. in Agr., Professor of Pomology

Arthur Bernhard Recknagel, B.A., M.F., Professor of Forestry.

Merritt Wesley Harper, M.S., Professor of Animal Husbandry.
Cyrus Richard Crosby, A.B., Extension Professor of Entomology.
Elmer Seth Savage, M.S.A., Ph.D., Professor of Animal Husbandry.
Kenneth Carter Livermore, B.S. in Agr., Professor of Farm Management.
Edward A. White, B.S., Professor of Floriculture.
Alvin Casey Beal, Ph.D., Professor of Floriculture.
Herbert Andrew Hopper, B.S.A., Extension Professor of Animal Husbandry.
Edward Sewall Guthrie, M.S. in Agr., Professor of Dairy Industry.
Maurice Chase Burritt, B.S. in Agr., Extension Professor in charge of Farm Bureaus.
Frank B. Moody, A.B., M.S.F., Extension Professor of Forestry.
William Charles Baker, B.S.A., Assistant Professor of Drawing.
George A. Everett, A.B., LL.B., Assistant Professor of Extension Teaching.
Clarence Arthur Rogers, M.S.A., Assistant Professor of Poultry Husbandry.
Lewis Knudson, B.S.A., Ph.D., Assistant Professor of Botany.
Mortier Franklin Barrus, A.B., Ph.D., Assistant Extension Professor of Plant Pathology.
James Chester Bradley, Ph.D., Assistant Professor of Systematic Entomology.
E. Gorton Davis, B.S., Assistant Professor of Landscape Art.
John Bentley, jr., B.S., M.F., Assistant Professor of Forestry.
Lewis Josephus Cross, B.A., Ph.D., Assistant Professor of Agricultural Chemistry.
George C. Embody, Ph.D., Assistant Professor of Aquiculture.
Oskar Augustus Johannsen, A.M., Ph.D., Assistant Professor of Entomology.
Clyde Hadley Myers, M.S., Ph.D., Assistant Professor of Plant Breeding.
Harry O. Buckman, M.S.A., Ph.D., Assistant Professor of Soil Technology.
Mrs. Helen Binkerd Young, B.Arch., Assistant Professor of Home Economics.
Alice Gertrude McCloskey, A.B., Assistant Professor of Rural School Education.
Mrs. Anna Botsford Comstock, B.S., Assistant Professor of Nature Study.
Ralph Hicks Wheeler, B.S., Assistant Professor of Extension Teaching.
Harry M. Fitzpatrick, Ph.D., Assistant Professor of Plant Pathology.
Byron Burnett Robb, B.S. in Agr., Assistant Professor of Farm Mechanics.
Walter Warner Fisk, M.S. in Agr., Assistant Professor of Dairy Industry.
Halsey B. Knapp, B.S., Assistant Extension Professor of Pomology.
Ralph Wright Curtis, B.S.A., M.S.A., Assistant Professor of Landscape Art.
Vern B. Stewart, A.B., Ph.D., Assistant Professor of Plant Pathology, in charge of Nursery Disease Investigations.
Annette J. Warner, Assistant Professor of Design.
Arthur Lee Thompson, M.S. in Agr., Instructor and Investigator in Farm Management.
Royal Gilkey, B.S.A., Instructor in Extension Teaching, and Supervisor of Mailing Division and Reading Courses.
Anna Clegg Stryke, A.B., Instructor in Entomology.
John Thomas Lloyd, A.B., Instructor in Limnology.
Charles Truman Gregory, B.S. in Agr., Instructor in Plant Pathology.
Lex R. Hesler, A.B., Instructor in Plant Pathology.
Ivan Claude Jagger, B.S. in Agr., Instructor in Plant Pathology.
William Howard Rankin, A.B., Instructor in Plant Pathology.
Robert A. Jehle, M.S.A., Instructor in Plant Pathology.

Clara W. Browning, B.S., Instructor in Home Economics.
Arthur Johnson Eames, Ph.D., Instructor in Botany.
Cecil Calvert Thomas, A.B., M.A., Instructor in Botany.
Mrs. Maude Cipperly Wiegand, A.B., Instructor in Botany.
James Kenneth Wilson, B.S., Instructor and Investigator in Botany.
William J. Robbins, A.B., Instructor in Botany.
Otis F. Curtis, M.S., Instructor in Botany.
Elmer Eugene Barker, A.B., Instructor in Plant Breeding.
Louis Hamilton Moulton, Instructor in Farm Practice, and Farm Superintendent.
Carl Edwin Ladd, B.S. in Agr., Instructor in Farm Management.
Daniel Scott Fox, B.S., Instructor in Farm Management.
Roland Harrison Patch, Instructor in Floriculture.
Paul Work, A.B., M.S. in Agr., Superintendent of Department and Instructor in Vegetable Gardening.
Charles Edwin Dimon, B.S., Instructor in Vegetable Gardening.
Albert Edmund Wilkinson, B.S., Extension Instructor in Vegetable Gardening.
Thomas Joseph McInerney, M.S. in Agr., Instructor in Dairy Industry.
Horace Mann Pickerill, B.S. in Agr., Instructor in Dairy Industry.
Harvey Lyon Ayres, Extension Instructor in Dairy Industry.
Eugene Davis Montillon, B.Arch., Instructor in Landscape Art.
Juan Estevan Reyna, E. E., Instructor in Drawing.
Edward Mowbray Tuttle, B.S.A., A.B., Instructor in Rural School Education.
Robert Matheson, M.S. in Agr., Ph.D., Investigator in Entomology.
Norman Damon Steve, B.S., Instructor in Farm Engineering.
Leslie Eugene Hazen, B.S. in Agr., Instructor in Farm Mechanics.
James Lewis Strahan, B.S. in Agr., M.S. in Agr., Instructor in Farm Mechanics.
L. Wayne Arny, B.S., Instructor and Investigator in Pomology.
Cass Ward Whitney, B.S., Instructor in Extension Teaching.
Royal J. Haskell, B.S., Instructor in Plant Pathology.

Other Officers of Instruction and Administration

George Walter Tailby, jr., Superintendent in Animal Husbandry.
Carl Ilg, Assistant Curator in Entomology.
Ada Eljiva Georgia, Assistant in the Farm Course.
Richard Alan Mordoff, B.S. in Agr., Assistant Registrar.
Charles Paul Alexander, B.S., Assistant in the Farm Course.
Mary E. Hill, B.S., Assistant in Biology.
Emmeline Moore, M.A., Assistant in Biology
Alice Ayr Noyes, B.A., Assistant in Biology.
Wilbert A. Clemens, B.A., Assistant in Biology.
William Colcord Woods, A.B., Assistant in Biology.
Harry E. Vick, B.S., Assistant in Biology.
Ira Myron Hawley, B.A., Assistant in Economic Entomology.
Rowland Willis Leiby, B.S., Assistant in Insect Morphology.
Albert Francis Coutant, B.S., Assistant in Parasitology.
Edward A. Richmond, B.S., Assistant in the Farm Course.
Karl Patterson Schmidt, Assistant in the Farm Course.
Gordon Ellwood Wightman, Assistant in the Farm Course.

William George Frisbie, Assistant in the Farm Course.
Gerd Miller Wendelkin, B.A., Assistant in Systematic Entomology.
Willis Robert Fischer, Laboratory Assistant in Plant Pathology.
Agnes A. McAllister, Assistant in Plant Pathology.
Charles Chupp, A.B., Assistant in Plant Pathology.
William Edwin Keefer, Ph.M., Assistant in Forest Pathology.
Ralph Simpson Nanz, B.S., Assistant in Botany.
Ruth Southwick Rodman, B.A., Assistant in Botany.
Theodore Cook Davis, A.B., Assistant in Botany.
Franklin William Pettey, B.A., Assistant in Botany.
Laurence Howland MacDaniels, A.B., Assistant in Botany.
Franklin Post Metcalf, A.B., Assistant in Botany.
William Frederick Friedman, Assistant in Plant Breeding.
Allan Cameron Fraser, Assistant in Plant Breeding.
Ralph Waldo Green, Assistant in Plant Breeding.
Lua Alice Minns, Student Assistant in Floriculture.
Alfred Carl Hottes, B.S., Student Assistant in Floriculture.
Julia Zita Kelly, Secretary and Curator in Floriculture.
Charles Herbert Van Auken, Clerk and Accountant in Animal Husbandry.
Walter Gernet Krum, Assistant and Superintendent in Poultry Husbandry.
Elizabeth Faith Genung, B.S. in Agr., Assistant in Dairy Industry.
George Cornell Supplee, B.S., Assistant in Dairy Industry.
Arthur Merle Besemer, B.S., Assistant in Dairy Industry.
Arthur Edward Potts, B.Sc., Assistant in Dairy Industry.
Charles Edward Hunn, Foreman of Grounds.
Andrew Jackson Lamoureux, Assistant in Library.
George Wilson Parker, Clerk.
Anna Elizabeth Hunn, B.S., Manager of Cafeteria.
Lucy Harriet Ashton, Assistant to the Registrar.
Emmons William Leland, B.S.A., Superintendent of Field Experiments in Soil Technology.
William Thomas Craig, Assistant in Plant Breeding.
Herbert W. Teeter, Superintendent of Garden (Plant Breeding).
Anna Mary Atwater, Laboratory Assistant in Plant Breeding.
Walton Isaac Fisher, Laboratory Assistant in Plant Breeding.
Mrs. Laura McLallen Van Auken, Clerk in Department of Dairy Industry.

THE NEW YORK STATE COLLEGE OF AGRICULTURE

SUMMER TERM

The college year in Cornell University is divided into two terms, or semesters, extending from the last of September to the early part of June. It has been the desire of the Faculty of Agriculture for many years to have the College in operation the year round, so that the summer season, especially advantageous in the teaching of certain phases of agriculture, could be utilized. This desire is now realized by the establishment of a full summer term which is coordinate with the present fall and spring terms.

The primary purpose of the summer term is to take advantage of the growing season in teaching certain subjects to students regularly registered in either graduate or undergraduate courses. The facilities of the College are available for graduate study throughout the summer. In addition, opportunity is provided for advanced students, teachers, and others, who are otherwise engaged during the regular school year, to have the advantage of a long period of special instruction.

In view of the fact that the introduction of the new term affects the organization of the entire college year, it will be possible in the summer of 1914 to offer only a limited number of courses. After the present year, when the readjustments will have been made, it is expected that courses will be given by most of the departments. A sufficient number of courses are offered for the present summer, however, so that students will have considerable choice in arranging their schedules.

Registration for the summer term will take place on June 8, 1914, between the hours of 9 a.m. and 4 p.m. All students are expected to register first at the office of the University Registrar in Morrill Hall. They will then present themselves at the office of the Secretary of the College of Agriculture, room 122, Main building, for further registration and arrangement of schedules. Instruction will begin at 8 a.m. on June 9. The summer term will close at 5 p.m. on September 23. No classes will be held on the forenoon of Commencement day, June 17, or on July 4.

The requirements for admission to the summer term are stated on page 11.

THE COLLEGE OF AGRICULTURE

Cornell University is composed of eight colleges and the Graduate School. One of these colleges is the College of Agriculture.

Cornell University was chartered by the Legislature in 1865, being founded on the Land Grant Act of 1862. By the terms of the Land Grant Act, teaching in agriculture has been from the first a regular part of the University enterprise. In other states the state government has made appropriations to supplement the work in agriculture. In 1904 the Legislature of the State of New York made an appropriation of $250,000 for the erection of buildings for the College of Agriculture at Cornell University, and established the College as a state institution under the title "The New York State College of Agriculture at Cornell University." Before this time the State had established at Cornell University "The New

York State Veterinary College." In 1906 the Legislature passed an Administration Act defining the purpose and activities of the College of Agriculture thus: "The object of the said college of agriculture shall be to improve the agricultural methods of the state; to develop the agricultural resources of the state in the production of crops of all kinds, in the rearing and breeding of live-stock, in the manufacture of dairy and other products, in determining better methods of handling and marketing such products, and in other ways; and to increase intelligence and elevate the standards of living in the rural districts. For the attainment of these objects the college is authorized to give instruction in the sciences, arts, and practices relating thereto, in such cases and in such manner as shall best serve the interests of the state; to conduct extension work in disseminating agricultural knowledge throughout the state by means of experiments and demonstrations on farms and gardens, investigations of the economic and social status of agriculture, lectures, publications of bulletins and reports, and in such other ways as may be deemed advisable in the furtherance of the aforesaid objects; to make researches in the physical, chemical, biological, and other problems of agriculture, the application of such investigations to the agriculture of New York, and the publication of the results thereof."

THE BUILDINGS AND FARMS

The buildings erected under the enactment of 1904 were first occupied in June, 1907. Subsequently the Legislature provided for the erection of two large barns, greenhouses, a home economics building, a poultry husbandry building, and an auditorium, all of which are now fully in use. Appropriations have been made also for the extension of the greenhouse range, the construction of two animal husbandry buildings, a forestry building, an agronomy building, additional barns, a rural schoolhouse, buildings for fowls in the Department of Poultry Husbandry, and a general heating plant for the College of Agriculture. These buildings are now under construction or under plan. It is expected that the forestry, poultry, and animal husbandry buildings will be in use during the summer term of 1914.

Other smaller buildings included in the present equipment are a frame building that temporarily houses the Department of Rural Engineering, a rural schoolhouse that serves as the headquarters for the Department of Rural School Education, an insectary, a biological station in the marsh at the south end of Cayuga Lake, a fish breeding house in Cascadilla Creek, a seed storage house, and other small buildings on the farms.

The Farms. The College of Agriculture has 766 acres of land and it rents 150 acres additional, making a total of 916 acres under college management. These farms are run not for commercial but for educational purposes, and the practices are therefore modified to meet the varied demands of the institution.

Land in the vicinity of the College is very broken, abounding in hills and dales, brooks and gorges. In consequence, less than one half of the total area is now available for tillage. Of the 916 acres, 508 are classified as arable, 188 as pasture, and 133 as wood and waste, 48 are devoted to college grounds, buildings, and old orchards, and 39 are retained for other uses.

Of the tillable area, 45 acres have been laid out in permanent experiment plots for the use of the Departments of Soil Technology and Plant Breeding; 50 acres have been assigned to the Department of Pomology and are largely planted to young trees; 45 acres have been assigned to the Departments of Floriculture and Vegetable Gardening; 73 acres to the Department of Poultry Husbandry; 9 acres to farm-crop gardens and experiments; and there are left to the Departments of Farm Practice and Farm Crops 286 acres on which the regular farm operations may be conducted.

The soil of the college farms is heavy, nearly all of it being Dunkirk clay loam. A few fields at the extreme southeastern corner are Volusia stony loam. The Dunkirk clay loam is entirely unsuited to potatoes and is not well adapted to corn, but will grow fair crops of corn if heavily manured. It is well adapted to wheat, oats, timothy, and clover. The Volusia stony loam when well drained and freed from stones is well adapted to corn and potatoes. The recently acquired areas lack both these improvements.

EXPENSES

Tuition in the College of Agriculture is free to both graduate and undergraduate students who for a year or more immediately preceding matriculation have been residents of the State of New York. The annual tuition fee for students from outside the State is $125 for two terms. The tuition fee for the summer term is $62.50.

Other fees, required of all students, are as follows:

Matriculation fee	$ 5.00
Fee for baccalaureate degree	10.00

Deposit fees are required in various laboratory courses; inquiry concerning these should be made before registration. Students are liable to a special charge for breakage or damage resulting from their own carelessness. Attention is called to the expenses of excursions required in various courses.

The expenses for textbooks, instruments, and other necessary articles varies from $10 to $75 a year.

There are many private boarding and rooming houses near the University campus. In these the cost of board and furnished room, with heat and light, varies from $5 to $12 a week. By the formation of clubs, students are sometimes able to reduce their expenses for room and board.

HONOR SYSTEM

With the consent of the faculty, examinations for agricultural students are conducted under the honor system, which is administered by a Committee on Student Honor. Every new student should acquaint himself at once with the regulations imposed by the honor system, copies of which are available at the office of the Secretary of the College.

GENERAL INFORMATION CONCERNING COURSES

The regular instruction in the College of Agriculture constitutes a course of four years, or eight terms, leading to the degree of Bachelor of Science. There is a combined course with the State Veterinary College comprising six years and leading to two baccalaureate degrees. Summer courses in agriculture, designed especially for teachers, school principals and superintendents, and college students, are offered in the six-weeks Summer Session of the University. Aside from these there are winter courses without University credit, and opportunities for students to pursue special work. Circulars describing the winter courses and the short summer courses may be obtained on application to the Secretary.

Students may pursue agricultural subjects in the Graduate School of the University. For full information concerning graduate work and degrees, see the Announcement of the Graduate School.

THE REGULAR FOUR-YEARS COURSE

Men who are candidates for admission to the regular, or four-years course must be at least sixteen years of age; women must be at least seventeen years of age. They must have certificates of good moral character, and students from other colleges or universities are required to furnish from those institutions certificates of honorable dismissal. Students are admitted on examination, or on presenting credentials of the Education Department of the State of New York, or on acceptable school certificates.

Prospective students who have neither lived on farms nor had considerable practical experience in agriculture are urged to spend at least one year on a well-managed farm in order to familiarize themselves with common farm affairs and operations before entering the College. This experience is imperative in order to pass the farm-practice requirements.

Candidates for admission must file their credentials and obtain permits for examination at the University Registrar's office, Morrill 10. The results of examination may be ascertained from the Registrar.

Entrance Requirements of Four-Years Course

The subjects that may be offered for admission are named in the following list; the figure in parenthesis following each subject indicates its value in units and shows the maximum and the minimum amount of credit allowed in the subject. A unit represents five recitations a week for one year in a study.

1a.	English A	(2)
1b.	English B	(1)
2a.	First Year Greek	(1)
2b.	Second Year Greek	(1)
2c.	Third Year Greek	(1)
3a.	First Year Latin	(1)
3b.	Second Year Latin	(1)
3c.	Third Year Latin	(1)
3d.	Fourth Year Latin	(1)
4a.	First Year German	(1)
4b.	Second Year German	(1)
4c.	Third Year German	(1)
5a.	First Year French	(1)
5b.	Second Year French	(1)
5c.	Third Year French	(1)
8a.	Ancient History	(½–1)
8b.	Modern History	(½–1)
8c.	Am. History, Civics	(½–1)
8d.	English History	(½–1)
9a.	Elementary Algebra	(1)
9b.	Intermediate Algebra	(½)
9c.	Advanced Algebra	(½)
9d.	Plane Geometry	(1)
9e.	Solid Geometry	(½)
9f.	Plane Trigonometry	(½)
9g.	Spher. Trigonometry	(½)
10.	Physics	(1)
11.	Chemistry	(1)
12.	Physical Geography	(½–1)
13.	Biology*	(1)

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*If an applicant has counted Biology (1) he may not offer also Botany (½) or Zoology (½).

6a. First Year Spanish	(1)
6b. Second Year Spanish	(1)
6c. Third Year Spanish	(1)
7a. First Year Italian	(1)
7b. Second Year Italian	(1)
7c. Third Year Italian	(1)
14. Botany*	(½–1)
15. Zoology*	(½–1)
16. Agriculture	(½–1)
17. Drawing	(½–1)
18. Manual Training	(1)
19. Any high school subject or subjects not already used	(½–1)

For admission to the New York State College of Agriculture, an applicant must offer either A or B as below:

A. Fifteen units arranged as follows: English (3), history (1), elementary algebra A (1), plane geometry (1), a foreign language** (3), elective (6). Solid geometry and plane trigonometry are recommended among the elective units for students entering the courses of forestry or landscape art.

B. The Arts College Entrance Diploma or the Science College Entrance Diploma issued by the Education Department of the State of New York.

Requirements for Admission of Special Students

Opportunities are provided for persons who desire to pursue special studies. In order to be eligible for admission to special work, applicants must offer two full years of recent farm experience and must also either have fifteen units of entrance credits or be twenty-one years of age. Applicants for admission on the age requirement must satisfy the faculty of their ability to handle the work; and every applicant must satisfy the faculty of his bona fide desire for special study. He will be required to present an honorable dismissal from the school last attended, certificates of good moral character, and such other certificates and letters as may be desired. The special work is designed to meet the needs of young men and young women from farms who have not time for a four-years course, and of mature persons who desire to spend a brief period in specialized study. The work is not a definite "course" in the sense of having a program or a prescribed set of studies. The student chooses any of the agricultural "electives" that he is fitted to pursue. Certain courses are given by some of the departments for students who lack some of the fundamental work usually required in those subjects. Admission as a special student does not admit to classes. The student is admitted to the various classes by the heads of the departments concerned.

Requirements for Admission to the Summer Term

Applicants for admission to the summer term as regular students in the four-years college course must, in addition to satisfying entrance requirements in full, have completed all the required work of the first two years of the regular course as outlined on page 13, or the substantial equivalent thereof. Special students are admitted to the summer term on the same basis as to other terms, as recited above.

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*If an applicant has counted Biology (1) he may not offer also Botany (½) or Zoology (½).

**French or German is recommended for entrance. For the Graduate School requirement with reference to a reading knowledge of French and German, see page 5 of the Announcement of the Graduate School.

Other Details of Admission

For other details as to subjects and methods of admission, see the General Circular of Information, which may be obtained on application to the Secretary, Cornell University, Ithaca, New York.

For admission to advanced standing from other colleges and universities, all communications should be addressed to the Registrar of the University. See the General Circular of Information.

For admission as a special student, communications should be addressed to the Secretary, College of Agriculture, and attention is called to the paragraphs on pages 26 and 27 of the General Circular of Information.

For admission to graduate work and candidacy for advanced degrees, communications should be addressed to the Dean of the Graduate School.

Requirements for the Degree of Bachelor of Science

The requirements for the degree of Bachelor of Science shall be residence for eight terms, and, in addition to the prescribed work in the Department of Physical Culture and of Military Science and Tactics, the completion of one hundred and twenty hours of required and elective work as outlined on pages 13 and 14.

A student admitted to the College of Agriculture from another college in Cornell University, or from any other institution of collegiate rank, will be regarded as having completed the number of terms and hours to which his records entitle him, and will receive all the privileges of students who have completed the same number of terms and hours by residence in the College. In order, however, to obtain the degree of Bachelor of Science, he must have completed the prescribed subjects in the four-years course and the requisite number of elective hours in agricultural subjects. He must also have been in residence in the College of Agriculture for at least two consecutive terms and have completed not less than fifteen hours a term, of which two-thirds, at least, must be subjects taught by the staff of the College of Agriculture.

A student must register for at least twelve hours each term and no new student may register for more than eighteen hours. Maximum registration by old students is determined on the basis of record.

All men students, except those whose record and registration at the beginning of the senior year show that they are specializing to the extent of fifteen hours in home economics, forestry, landscape art, entomology, or plant breeding, must fully satisfy, before the beginning of the senior year, the requirements in farm practice. All men students are required to report to the Department of Farm Practice within the first three weeks of the first term in the College.

Regular students may take at their discretion during their four years not to exceed twenty hours of elective subjects in courses offered in other colleges than Agriculture; but such elective subjects shall not interfere with required or back work. Special students must take at least two-thirds of the entire work of each year from subjects taught by members of the staff of Agriculture.

The Course Leading to the Degree of Bachelor of Science

Freshman year	Number of course	Hours 1st term	Hours 2d term
English	1	4	4
Chemistry	1	6	–
Chemistry	85 or 6	–	4 or 5
Biology	1	3	3
The Farm		2	–
Physics	2		5
Electives*		0–3	0–2
Total		15–18	16–18

Sophomore year	Number of course	Hours 1st term	Hours 2d term
Geology**	1	3	–
Chemistry†	85, 85a	(2)	6
Physiology,‡ one of the following:			
Physiology of domestic animals	12	–	3
Human physiology	3	–	3
Plant physiology	20 or 21	–	4
Botany or	1	3	3
Zoology	1	5	–
Electives		5–12	6–12
Total		15–18	15–18

In addition to the above, the required work in military drill and physical training must be taken.

Political Science 51 may be taken during this year.

Junior year	Number of course	Hours 1st term	Hours 2d term
Political Science	51	3	3

Elective Subjects and Group Requirements

The remainder of the work is made up of electives to be taken under the following restrictions:

A student may take at his discretion during his four years not to exceed twenty hours of elective subjects in courses offered in other colleges than Agriculture; but such elective subjects shall not interfere with required or back work. The remainder of his elective work must be offered from subjects taught by members of the staff of Agriculture.

In selecting the subjects in the major group in Agriculture, the student must obtain the advice and approval of a professor or an assistant professor having charge of a subject within the group and preferably within the department in which he expects to specialize, who shall be chosen by the student at the beginning of the sophomore year. Students expecting to specialize in forestry, landscape art, or home economics must take as their advisers professors or assistant professors in those departments.

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*Professional students in forestry who do not offer solid geometry and plane trigonometry for entrance are required to take these subjects in their freshman year.

**Optional for students taking a major in home economics.

†Required of students taking Chemistry 6 in the freshman year. The laboratory work, 85a, may be taken during the first term, leaving the four-hours lecture course for the second term. Students who do not take Chemistry 6 cannot take 85a.

‡May be taken in junior or senior year by special permission.

All students must have passed before graduation at least fifteen hours of agricultural electives in one of the groups named below, and at least three hours in each of three of the other groups:

Group A—Farm Crops
  Pomology
  Soil Technology
  Floriculture
  Vegetable Gardening
Group B—Animal Husbandry
  Poultry Husbandry
  Dairy Industry
  Entomology
Group C—Agricultural Chemistry
  Botany
  Plant Breeding
  Plant Pathology
  Meteorology
Group D—Rural Economy
  Farm Management
  Extension
  Rural Engineering
  Drawing
Group E—Forestry
  Home Economics
  Landscape Art

DEPARTMENTS OF INSTRUCTION

BOTANY

6a. **Taxonomy of the Higher Plants.** Credit, five hours. Prerequisite Botany 1 or its equivalent. M W F, 8–1. Botanical Laboratory, Agronomy Building. Professor WIEGAND and Mr.

Identification, classification, and ecology of seed plants and ferns: a detailed study of the local flora about Ithaca, with reference to the recognition of species and varieties, to the classification and scientific nomenclature of these forms, and to their floral and foliar characteristics. The course consists largely of field and laboratory work, but is supplemented by general discussions and lectures on the broader questions of classification, nomenclature, distribution, and habitat. The ecological associations and modifications of the various species and varieties will be noted. Instruction will be given in the preparation of an herbarium and in the preparation of keys.

Students are urged to take this course rather than the corresponding course given during the fall term. Work on the flora can be prosecuted with much greater success during the summer, when fresh plants are to be obtained. The situation of Ithaca is ideal for this work because of the very rich and varied nature of the flora, which renders an unusual variety of forms and conditions quickly accessible. The period of time covered by the course (June to September) renders almost the whole summer flora available for study. Some of the field trips will lead into rough country, and suitable clothing should be provided. Women will frequently find the bloomer costume convenient. Laboratory fee, $1.

18. **Research in Histology, General Botany, and Taxonomic Botany.** Open only to graduate students. Professor WIEGAND.

19. **Seminar.** The graduate students registered during the summer term will meet, at times to be arranged, for the discussion of current problems. Professor WIEGAND.

21a. **Advanced Plant Physiology.** Credit, four hours. Prerequisite training in botany and chemistry, to be determined in each case by the instructor. Lectures, M W, 8. Agronomy Building 192. Laboratory, M W, 10–12.30. Assistant Professor KNUDSON and Mr. NANZ.

Topics include nutrition, osmotic pressure, permeability, absorption, conduction, transpiration, toxicity, and photosynthesis. Laboratory fee, $6.

21b. **Advanced Plant Physiology.** Credit, four hours. Prerequisites as above. Lectures, T Th, 8. Agronomy Building 192. Laboratory, T Th, 10–12.30. Assistant Professor KNUDSON and Mr. NANZ.

Topics include metabolic products, digestion, translocation, respiration, fermentation, growth, stimulation, reproduction, and plant response. Laboratory fee, $6.

These two courses are the equivalent of course 21, the credit for which is four hours in both fall and spring terms. The present division into two courses is arbitrary, one course representing the work of the fall term and the other representing that of the spring term. These courses are designed primarily for advanced or graduate students, and especially for those specializing in plant study. Lectures and laboratory work are supplemented by written reports. Students may take 21a and 21b simultaneously, or either may be taken alone.

31. **General Seminar in Plant Physiology.** Credit, one hour. Time and place to be arranged. Assistant Professor KNUDSON.

33. **Research in General Physiology.** Credit for major or minor, otherwise not less than four hours a term. Prerequisite adequate training in botany, chemistry, and physiology. Hours by appointment. Assistant Professor KNUDSON.

DAIRY INDUSTRY

1. **Milk Composition and Tests.** (To be given if at least five students register for the course.) Credit, three hours. For regular students only. Lectures, T, 11. Recitations, Th, 11. Dairy building 222. Laboratory, T, 2–4.30. Dairy Building 232. Professor TROY and Mr. JONES.

The topics considered are secretion and composition of milk, sampling, lactometer, Babcock test for fat, acid tests, salt tests, moisture tests, preservative tests. Laboratory deposit, $3, part returnable.

7. **Advanced Testing.** Credit, two hours. Must be preceded by course 1. Laboratory course, M, 10–1, Th, 2–5. Dairy Building 202. Professor TROY and Mr. JONES.

The work considers such subjects as the determination of moisture and dry matter in dairy products, commercial test for casein, Babcock test for butter and oleomargarine, tests for preservatives and adulterations, milk modification. Laboratory deposit, $2, part returnable.

This course will not be given unless there is a registration of at least twelve students; more than fifteen students cannot be accommodated.

ENTOMOLOGY, BIOLOGY, AND NATURE STUDY

Entomology

[1. **The Ecology of Insects.** Credit, three hours. One lecture and two practical exercises. Professor NEEDHAM.] Not given in 1914.

A general course in the study of the lives of insects in relation to their environment; mainly field work. Practical studies will be made of the activities of insects and of the rôle that they play in different natural associations. Observations will be made on the relations between their structures and instincts and the situations in which they live, and on many of the ways in which they find a living and establish homes.

3. **General Entomology.** Credit, three hours. Prerequisite Biology 1 or Zoology 1. Lectures, daily except S, 8, July 6 to August 14. Miss STRYKE. Practical exercises, two afternoons by appointment, 2–4.30, July 6 to August 14. Miss STRYKE and Mr. COUTANT. Main Building 392.

Lectures on the characteristics of orders, suborders, and the more important families, and on the habits of representative species. The practical exercises include a study of the structure of insects and practice in their classification. The lectures only (credit two hours) are taken by those who have had or are taking courses 4 and 5. Laboratory fee, $3.

4. **Elementary Morphology of Insects.** Credit, three hours. Laboratory open daily except S, 8–5. Main Building 391. Miss STRYKE and Mr. COUTANT.

An introductory laboratory course required of all students who plan to do advanced work in entomology. Laboratory fee, $2.

5. **Elementary Systematic Entomology.** Credit, two hours. Must be preceded or accompanied by course 4. Laboratory open daily except S, 8–5. Main Building 391. Miss STRYKE and Mr. COUTANT.

Practice in the identification of insects, and in the method of phylogenetic study as illustrated by their wing venation. With course 4, required of all students who plan to do advanced work in entomology. Laboratory fee, $3.

11. **Morphology and Classification of the Arachnida.** Credit, three or more hours. Lectures, laboratory work, and field work by appointment. Miss STRYKE.

There are exceptional opportunities about Ithaca for obtaining representative Arachnida; students electing this work will be expected to collect their own material. The department cannot undertake to furnish specimens for classification.

20. **Morphology and Development of Insects.** Credit, two hours. Prerequisite courses 3, 4, and 5. Lectures, W F, 9. Laboratory work to accompany or follow this course is offered under course 21. Main Building 392. Professor W. A. RILEY.

21. **Histology of Insects.** Credit, three or more hours. Prerequisite courses 3, 4, and 5. Laboratory open daily except S, 8–5. Main Building 391. Professor W. A. RILEY.

A laboratory course to accompany or follow the first term of course 20. Laboratory fee, $1.50 an hour.

29. **Research in Morphology of Insects.** Credit, three or more hours. Prerequisite courses 3, 4, and 5. Laboratory open daily except S, 8–5, S, 8–1. Main Building 391. Professor W. A. RILEY.

Special work arranged with reference to the needs and attainments of each student. Laboratory fee, $1.50 an hour.

31. **Relations of Insects to Disease.** Credit, two hours. Prerequisite first term of course 3 or 30. Lectures, M, 9. Main Building 392. Practical exercises, sec. 1, M, 2–4.30; sec. 2, T, 2–4.30. Professor W. A. RILEY.

Causation and transmission of disease by insects and other arthropods. Laboratory fee, $2.

[40. **Advanced Economic Entomology and Insectary Methods.** Credit, two hours. Open only to graduates. Seminar, T, 2–4.30. Field and laboratory work by appointment. Professor ———.] Not given in 1914.

Economic problems connected with applied entomology will be discussed and reported on, and field observations will be made. Experimental methods in breeding, photographing, investigating, and controlling insects will be discussed and studied. Designed for advanced students in entomology who desire to fit themselves for experiment station work. Laboratory fee, $2.50.

[49. **Research in Economic Entomology.** Credit, three or more hours. Prerequisite courses 3, 4, and 5. Laboratory and field work by appointment. Insectary. Professor ———.] Not given in 1914.

50. **General Limnology.** Credit, four hours. Open only to students who have taken or are taking course 3 and Biology 1 or equivalent courses. Lectures, T Th, 10. Main Building 392. Laboratory by appointment. Mr. LLOYD.

59. **Research in Limnology.** Credit, three or more hours. Prerequisite course 50 or its equivalent. Laboratory and field work by appointment. Main Building 492 and Biological Field Station. Professor W. A. RILEY and Mr. LLOYD.

Seminar. M, 4.30–5.30. Main Building 392.

The work of an entomological seminar is conducted by the Jugatae, an entomological club that meets for the discussion of current literature and of the results of investigations. Attendance at the meetings may be counted as laboratory work.

FLORICULTURE

3. **Commercial Floriculture.** Credit, three hours. Prerequisite course 1 or commercial experience; and students are advised to take course 2 before entering this course. Lectures and recitations, W F, 9. Main Building 232. Practice, W, 2–4.30. New greenhouses. Professor WHITE and Mr. PATCH.

This course will include lectures, laboratory exercises, and assigned readings on the propagation and culture of the leading floricultural crops. As facilities permit, students will be assigned space in the greenhouses for practical experience in the growing of roses, carnations, chrysanthemums, violets, and plants of like character. During the summer term, training will be given in the field culture of these and other florists' flowers. Laboratory fee, $2.

5. **Greenhouse and Garden Practice.** Credit, one or two hours. Prerequisite course 1 and permission to register. Practice by appointment. New greenhouses and gardens. Professor WHITE, Mr. PATCH, and greenhouse assistants.

Designed to give the student added practical knowledge of greenhouse and garden work. The course includes practice work in all lines of indoor and outdoor flower growing. Weekly reports are assigned.

9. **Garden Flowers.** Credit, three hours. Lectures, M W, 9. Main Building 232. Practice, T or Th, 2–4.30. New greenhouses and gardens. Mr. HOTTES and Miss MINNS.

This course is designed to follow course 8 and to acquaint the student with the value of all annual herbaceous perennial plants, their character, and their culture. Members of the class will be assigned the care of certain flower beds planted earlier in the season. Lectures will be held out of doors whenever the weather will permit. All members of the class will participate in an excursion to the Thompson Estate at Canandaigua on August 15. Laboratory fee, $2.

10. **Amateur Floriculture.** Credit, one hour a term. Lectures and practice, S, 10.30–1. New greenhouses and gardens. Miss MINNS.

The propagation and culture of plants suitable for window gardens and dooryards, including a study of containers, soils, fertilizers, insecticides; also, preparation and planting of flower beds. The work will be so arranged that the student may follow the development of plants from seed or cutting to maturity. Laboratory fee, $1 a term.

11. **Investigation in Floriculture.** Credit, one, two, or three hours a term. Prerequisite courses 1, 3, and 4, and permission to register. Professors WHITE and BEAL.

Designed primarily for upperclassmen and graduate students. Consultation by appointment. The investigation of problems in growing cut flowers, exotics, garden flowers, and the like.

12. **Seminar.** Credit, one hour a term. Required of advanced students who elect course 11, and of all graduate students. Th, 4.35–5.45. Main Building 232. Professor WHITE and members of the staff.

PLANT BREEDING

6. **Plant Breeding.** Credit, three hours, Prerequisite Biology 1, and Botany 1 or Zoology 1. Lectures, T Th, 12. Laboratory, S, 8–10.30. Forestry Building. Professor GILBERT.

A general elementary course designed to give the principles of plant breeding. The course consists of lectures, recitations, and field practice. Course 6 is similar to courses 1 and 2 combined, and it is offered during the summer when more and better material is at hand for instructional purposes. Laboratory fee, $3.

13. **Advanced Plant Breeding.** Credit, three hours. Prerequisite course 3. Lectures, W F, 10. Laboratory, F, 2–4.30. Forestry Building. Professor Gilbert.

Conferences on and field practice in advanced principles and methods of breeding. Laboratory fee, $3.

16. **Research.** Special work for a few advanced graduate students, arranged with reference to individual aims and attainments. By appointment. Agronomy building 311. Members of the departmental staff.

Problems in plant breeding, heredity, and general evolution. (For requirements and directions, see the pamphlet issued by the department.)

PLANT PATHOLOGY

1. **Plant Pathology.** Credit, three hours. Prerequisite Botany 1 or its equivalent. Recitations, F, 12. Auditorium. Practice, W F, 2–4.30. (If registration warrants, another practice section will be offered, Th, 2–4.30, S, 8–10.30.) Auditorium, west basement. Mr. Hesler and Mr. Weimer.

A fundamental course treating of the common diseases of cultivated crops, their nature, cause, and control. A prerequisite for all other courses in plant pathology. Laboratory fee, $4.50; breakage deposit, $2.

[2. **Principles of the Control of Plant Diseases.** Credit, three hours. Prerequisite course 1.] Not offered in 1914.

A consideration of methods for the control of plant diseases, including sanitation, seed treatment, seed selection, spraying, tree surgery, immunization, preservation of timber, and the like. Laboratory fee, $4.50; breakage deposit, $2.

6. **Mycology.** Credit, three hours. Prerequisite course 1 or its equivalent. Lectures, M, 12. Auditorium. Practice, M T, 2–4.30. Auditorium, west basement. Mr. Hesler and Mr. Weimer.

A synoptical course intended to acquaint the student with the general field of mycology. Laboratory fee, $4.50; breakage deposit, $2.

20. **Research.** Not less than three hours. Professors Whetzel and Reddick, and Assistant Professors Barrus, Fitzpatrick, and Stewart.

Original investigation of problems in plant pathology. Laboratory fee, $1.50 an hour.

POMOLOGY

1. **Elementary Pomology.** Credit, three hours. Prerequisite Biology 1 or Botany 1. Lectures, T Th, 11. Recitations, F, 11. Main Building 232. Mr. Arny.

A study of the methods of propagation and early care of commercial fruits, including the growing of seedlings, cuttings, and layers; the principles of budding, grafting, pruning, and planting; soils, varieties, and planting plans for the orchard. (See course 1a.)

1a. **Elementary Pomology.** Credit, one hour. Prerequisite Biology 1 or Botany 1. Required of students taking the advanced courses in pomology. Laboratory course to follow course 1. M, 2–4.30. Main Building 202. Messrs. Rogers and Peck.

Practical exercises in budding, grafting, pruning, and planting; a study of varieties, nursery trees, and fruit buds. Laboratory fee, $2.

19. **Research in Pomology.** Credit, one or more hours. Prerequisite courses 1, 1a, 2, 8, and sufficient training in chemistry, plant physiology, plant pathology, and entomology. F, 9. Main Building 202. Professor Chandler.

Original investigation of problems in pomology. A typewritten and bound thesis is required.

POULTRY HUSBANDRY

2. **Feeding and Care.** Credit, one hour. Practice, three short periods a day, including Sunday, for four weeks beginning July 8; morning, 7.45–8.30; noon, 12.45–1.15; night, 4.30–5. Poultry plant. Professor Rice and Mr. ———.

Record keeping, and management of fowls for egg production and for fattening, including preparation for market. Reading will be required and a written examination will be held.

3. **Incubator Practice.** Credit, one hour. Must be preceded or accompanied by course 1, 1a, or 10. Practice, three short periods a day, including Sunday, for four weeks beginning July 8: morning, 7.45–8.30; noon, 12.45–1.15; night, 4.30–5. Poultry Building. Professor Rice and Mr. ———.

Practice in operating incubators, testing eggs, keeping records, and taking apart and setting up machines. Reading will be required and a written examination will be held.

3a. **Brooder Practice.** Credit, one hour. Must be preceded or accompanied by course 1, 1a, or 10. Practice, three short periods a day, including Sunday, for four weeks beginning July 8: morning, 7.45–8.30; noon, 12.45–1.15; night, 4.30–5. Poultry Building. Professor Rice and Mr. ———.

The management of a brooder and a flock of chickens; the keeping of temperature, food, and growth records. Reading will be required and a written examination will be held.

10. **Farm Poultry.** Credit, three hours. Lectures, M W, 11. Poultry Building 375. Professor Rice. Practice, M, 2–4.30. Poultry building 300. Mr. Kent.

An elementary course covering briefly the general field of poultry husbandry; primarily for persons who expect to make poultry keeping a minor part of farming.

Seminar. Credit, one to three hours a term. Prerequisite courses 1 or 1a and 2 and 3; must be preceded or accompanied by courses 4, 5, 7, and 8; can best be taken in the last year by special students and in the junior or senior year by regular students. Recitations and conferences by appointment. Poultry Building. Professor Rice, and Messrs. Benjamin and Kent.

12. **Research.** Credit, one to three hours a term. Prerequisite courses 1 or 1a, and 2 and 3; must be preceded or accompanied by courses 4, 5, 7, 8, and 11. By appointment. Poultry Building. Professor Rice and Mr. Benjamin.

An original investigation of a problem in poultry husbandry, to be presented as a written thesis.

RURAL ENGINEERING

3. **Farm Mechanics.** Credit, three hours. Students are urged to take Drawing 1 in preparation for this course. Lectures, W F, 8. Animal Husbandry Building 112. Laboratory, F, 2–4.30. Rural Engineering Building. Mr. HAZEN.

A study of the principles of operation, the details of construction, and the practical operation and care of: a—machinery, including gasoline engines, devices for transmitting power, hydraulic rams, pumps, water-supply outfits; b—implements, including plows and binder attachments, with a discussion of the special mechanical features of some of these implements now on the market. Laboratory fee, $2.

20. **Farm Engineering.** Credit, three hours. Prerequisite plane geometry; students are urged to take Drawing 1 in preparation for this course. Lectures, T Th, 10. Animal Husbandry Building 112. Laboratory, W, 2–4.30. Rural Engineering Building. Mr. STRAHAN.

A study of the practical solution of the elementary problems involved in connection with surveying and mapping the farm; leveling and estimating for drains; laying out building foundations and farm water-supply and sewage-disposal systems. From the data obtained in the field a contour map will be drawn for one of the fields near the college buildings. Attention will be given also to concrete construction, the design of simple structures, and estimates of their cost. Laboratory fee, $1.

30. **Farm Structures.** Credit, three hours. Prerequisite Drawing 1 or its equivalent. Lectures, T Th, 12. Animal Husbandry Building 112. Laboratory, S, 8–10.30. Dairy Building 119. Mr. HAZEN.

A study of building materials used on the farm; the principles of construction for barns, stables, and other farm buildings, and their application in practice.

SOIL TECHNOLOGY

1. **Principles of Soil Management.** Credit, three hours. Prerequisite Chemistry 1 and Geology 1. Lectures, T Th, 9. Home Economics Building 100. Laboratory, one period, 2–4.30. Agronomy Building 42. Students must consult Professor Buckman before choosing laboratory period. Assistant Professor BUCKMAN.

A comprehensive course dealing with the origin, composition, and properties of soils, with particular reference to their management in crop production. The laboratories will consist of practice designed to demonstrate fundamental physical relations, and will be supplemented by laboratory lectures. Laboratory deposit, $3.

VEGETABLE GARDENING

5. **Systematic Vegetable Crops.** Credit, three hours. Prerequisite course 3, or, in special cases, course 2 with permission to register. Lectures, Th, 8. Home Economics Building 370. Laboratory, Th, 2–4.30; S, 8–10.30. Vegetable head-house. Messrs. WORK and DIMON.

Lectures and descriptive studies dealing with vegetable crops, their origin and botany. Special attention will be given to varieties and their adaptation to different cultural and market conditions. The important commercial types of different vegetables are grown in the garden each year, and there is an abundance of first-hand material for the course. Each student will make special systematic study of a crop or a group of crops, and will present a report in typewritten form.

6. **Practice.** Credit, one or two hours. Prerequisite permission to register. By appointment. Mr. WORK.

Opportunity will be offered for a few students who are specializing in vegetable gardening to obtain practice in greenhouse and gardens.

7. **Undergraduate Research.** Credit, one to three hours. Prerequisite course 3 and permission to register. By appointment. Mr. WORK.

A special problem, a typewritten report on which is expected. Laboratory fee according to the nature of the problem.

OFFICIAL PUBLICATIONS OF CORNELL UNIVERSITY

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These publications include

Catalogue Number (containing lists of officers and students), price 25 cents,
Book of Views, price 25 cents,
Directory of Faculty and Students, Second term, 1913–14, price 10 cents, and the following informational publications, any one of which will be sent gratis and post-free on request. The date of the last edition of each publication is given after the title.
General Circular of Information for prospective students, February 1, 1914.
Announcement of the College of Arts and Sciences, May 15, 1913.
Announcement of Sibley College of Mechanical Engineering and the Mechanic Arts, January 1, 1914.
Announcement of the College of Civil Engineering, February 15, 1914.
Announcement of the College of Law, April 15, 1913.
Announcement of the College of Architecture, June 1, 1913.
Announcement of the New York State College of Agriculture, June 15, 1913.
Announcement of the Winter Courses in the College of Agriculture, July 1, 1913.
Announcement of the Department of Forestry, July 15, 1913.
Announcement of the Summer Term in Agriculture, April 15, 1914.
Announcement of the New York State Veterinary College, April 1, 1914.
Announcement of the Graduate School, January 15, 1914.
Announcement of the Summer Session, March 15, 1914.
Annual Report of the President, November 1, 1913.
Pamphlets on scholarships, fellowships, and prizes, samples of entrance and scholarship examination papers, special departmental announcements, etc.

Correspondence concerning the publications of the University should be addressed to

The Secretary of Cornell University,
Ithaca, New York.

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VOLUME VII NUMBER 9

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ANNOUNCEMENT OF THE SUMMER TERM

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CALENDAR

Summer Term, 1916

June 12,	Monday,	Registration of all students.
June 13,	Tuesday,	Instruction begins in all courses.
June 21,	Wednesday,	Forty-eighth Annual Commencement. Half holiday.
July 4,	Tuesday,	Holiday.
Sept. 27,	Wednesday,	Instruction ends.

Summer Session

July 6,	Thursday,	Summer Session begins.
Aug. 16,	Wednesday,	Summer Session ends.

Fall Term, 1916–17

Sept. 15,	Friday,	Entrance examinations begin.
Sept. 25–26,	Monday–Tuesday,	Registration of new students.
Sept. 27,	Wednesday,	Registration of old students.
Sept. 28,	Thursday,	Instruction begins.
Sept. 30,	Saturday,	Registration, Graduate School.

NEW YORK STATE COLLEGE OF AGRICULTURE

FACULTY

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Beverly Thomas Galloway, B.Agr. Sc., LL.D., Dean of the College of Agriculture and Director of the Experiment Station.
Isaac Phillips Roberts, M.Agr., Professor of Agriculture, Emeritus.
John Henry Comstock, B.S., Professor of Entomology and General Invertebrate Zoology, Emeritus.
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Edward Riley King, B.S., Assistant Professor of Entomology.
Frank Elmore Rice, A.B., Ph.D., Assistant Professor of Agricultural Chemistry.
Lester Whyland Sharp, B.S., Ph.D., Assistant Professor of Botany.
Paul Work, A.B., M.S. in Agr., Superintendent of the Department and Instructor in Vegetable Gardening.
Layton S. Hawkins, B.A., Specialist in Agricultural Education, Lecturer in Rural Education.

George Walter Tailby, jr., B.S.A., Instructor and Superintendent of Livestock.
Charles Harvey Hadley, jr., B.S., Investigator in Entomology.
John Thomas Lloyd, A.B., Instructor in Limnology.
Bertha E. Titsworth, B.S., Instructor in Home Economics.
Helen Knowlton, A.B., Instructor in Home Economics.
Cecil Calvert Thomas, A.B., M.A., Instructor in Botany.
Earle Volcart Hardenburg, M.S. in Agr., Instructor in Farm Crops.
Richard Alan Mordoff, B.S. in Agr., Assistant Registrar.
Otis Freeman Curtis, M.S., Instructor in Botany.
Oliver Wesley Dynes, M.S. in Agr., Instructor in Farm Crops.
Daniel Scott Fox, B.S., Instructor in Farm Management.
Albert Edmund Wilkinson, B.S., Extension Instructor in Vegetable Gardening.
Thomas Joseph McInerney, M.S. in Agr., Instructor in Dairy Industry.
Horace Mann Pickerill, B.S. in Agr., Instructor in Dairy Industry.
Eugene Davis Montillon, B.Arch., Instructor in Landscape Art.
Juan Estevan Reyna, E.E., Instructor in Drawing.
Leslie Eugene Hazen, B.S. in Agr., Instructor in Farm Structures.
James Lewis Strahan, B.S. in Agr., Instructor in Farm Structures.
Earl Long Overholser, M.A., Instructor in Pomology.
Cass Ward Whitney, B.S., Instructor in Extension Teaching.
Royal Josylin Haskell, B.S., Instructor in Plant Pathology.
Charles Paul Alexander, B.S., Instructor in Natural History.
Charles Chupp, A.B., Instructor in Plant Pathology.
Laurence Howland MacDaniels, A.B., Instructor in Botany.
Allan Cameron Fraser, B.S., Instructor in Plant Breeding.
Lua Alice Minns, B.S., Instructor in Floriculture.
Alfred Carl Hottes, B.S., M.S. in Agr., Instructor in Floriculture.
George Cornell Supplee, M.S.A., Instructor in Dairy Industry.
Anna Elizabeth Hunn, B.S., Instructor in Home Economics, and Manager of the Cafeteria.
William Thomas Craig, Instructor in Plant Breeding.
Montgomery Robinson, Litt.B., B.S., Instructor in Extension Teaching.
Arthur John Heinicke, B.S.A., M.A., Instructor in Pomology.
Olney Brown Kent, B.S., Instructor in Poultry Husbandry.
Harold Deane Phillips, A.B., B.S. in Agr., Instructor in Rural Economy.
Henry William Schneck, B.S., M.S.A., Instructor in Vegetable Gardening.
Wesley Worth Warsaw, B.S. in A.E., Extension Instructor in Soil Technology.
Karl John Seulke, M.S.A., Instructor in Animal Husbandry.
DeVoe Meade, B.S., Instructor in Animal Husbandry.
Edward Gardner Misner, B.S., Instructor in Farm Management.
Bernard William Shaper, B.S., Instructor in Extension Teaching.
Arthur Merle Besemer, B.S., Instructor in Dairy Industry.
Archie Byron Dann, B.S., Instructor in Poultry Husbandry.
Edwin Sleight Ham, B.S., Instructor in Animal Husbandry.
Thomas Alexander Baker, B.S., Instructor in Animal Husbandry.
James LeRoy Weimer, A.B., Extension Instructor in Plant Pathology.
Louis Melville Massey, Ph.D., Instructor in Plant Pathology.
Cornelia Ferris Kephart, M.S. in Agr., Instructor and Librarian in Department of Entomology.
Leon Augustus Hausman, B.A., Instructor in Meteorology.
Ellis Lore Kirkpatrick, B.S.A., Instructor in Vegetable Gardening.
Winfred Enos Ayres, Extension Instructor in Dairy Industry.
John Clarence McCurdy, B.S., C.E., Instructor in Farm Engineering.
William Emerson Mordoff, M.E., Instructor in Farm Mechanics.
Albert Scott Kenerson, B.S., Instructor in Vegetable Gardening.
Mary Frances Henry, A.B., Instructor in Home Economics.
Beulah Blackmore, Instructor in Home Economics.
Howard Bowman Ellenberger, B.S.A., Instructor in Dairy Industry.
Clark Leonard Thayer, B.Sc., Instructor in Floriculture.
Ralph Sylvanus Moseley, Extension Instructor in Poultry Husbandry.

Lewis Merwin Hurd, Extension Instructor in Poultry Husbandry.
Henry Joseph Conlin, A.B., Instructor in Agricultural Chemistry.
Harold Allen Severy, A.B., A.M., Instructor in Botany.
Roy Glen Wiggans, B.S., M.S. in Agr., Instructor in Farm Crops.
William Irving Myers, B.S.A., Instructor in Farm Management.
Lew Ellsworth Harvey, B.S.A., Instructor in Farm Management.
Cedric Hay Guise, B.S., M.F., Instructor in Forestry.
Emil Volz, B.Sc., Instructor in Floriculture.
Walter Sprague Frost, B.S., Instructor in Soil Technology.
Anson Wright Gibson, Instructor in Farm Practice.
Gilbert Warren Peck, B.S., Extension Instructor in Pomology.
Frances Vinton, B.A., Instructor in Home Economics.
Albert Reiff Bechtel, A.M., Instructor in Botany.
John Phineus Benson, B.S., Instructor in Botany.
James Marshall Brannon, B.A., M.A., Instructor in Botany.
Frank Burkett Wann, A.B., Instructor in Botany.
Ray F. Pollard, B.S., Instructor in Farm Management.
Walter Gernet Krum, Extension Instructor in Poultry Husbandry.
Thomas Burr Charles, B.S., Instructor in Poultry Husbandry.
Charles S. Brewster, B.S.A., Instructor in Poultry Husbandry.
William Trowbridge Merryfield Forbes, Ph.D., Instructor in Entomology.
Stuart Ward Frost, B.S., Instructor in Entomology.
Wallace Larkin Chandler, B.S., M.S., Instructor in Parasitology.

THE NEW YORK STATE COLLEGE OF AGRICULTURE

SUMMER TERM

The college year in Cornell University is divided into two terms, or semesters, extending from the last of September to the early part of June. In the College of Agriculture there is, in addition, a third, or summer, term, coordinate with the present fall and spring terms.

The primary purpose of the summer term is to take advantage of the growing season in teaching certain subjects to students regularly registered in either graduate or undergraduate courses. The facilities of the College are available for graduate study throughout the summer. In addition, opportunity is provided for advanced students, teachers, and others, who are otherwise engaged during the regular school year, to have the advantage of a long period of special instruction. Particular attention is given to the needs of assistants and instructors in colleges of agriculture who desire to spend their summers in advanced study.

Registration for the summer term will take place on June 12, 1916, between the hours of 9 a. m. and 4 p. m. All students are expected to register first at the office of the University Registrar in Morrill Hall. They will then present themselves at the office of the Secretary of the College of Agriculture in Roberts Hall for further registration and arrangement of schedules. Instruction will begin at 8 a. m. on June 13. The summer term will close at 5 p. m. on September 27. No classes will be held on the forenoon of Commencement Day, June 21, or on July 4.

The requirements for admission to the summer term are stated on page 11.

THE COLLEGE OF AGRICULTURE

Cornell University is composed of eight colleges and the Graduate School. One of these colleges is the College of Agriculture.

Cornell University was chartered by the Legislature in 1865, being founded on the Land Grant Act of 1862. By the terms of the Land Grant Act, teaching in agriculture has been from the first a regular part of the University enterprise. In other states the state government has made appropriations to supplement the work in agriculture. In 1904 the Legislature of the State of New York made an appropriation of $250,000 for the erection of buildings for the College of Agriculture at Cornell University, and established the College as a state institution under the title "The New York State College of Agriculture at Cornell University." Before this time the State had established at Cornell University "The New York State Veterinary College." In 1906 the Legislature passed an Administration Act defining the purpose and activities of the College of Agriculture thus: "The object of the said college of agriculture shall be to improve the agricultural methods of the state; to develop the agricultural resources of the state in the production of crops of all kinds, in the rearing and breeding of livestock, in the manufacture of dairy and other products, in determining better methods of handling and marketing such products, and in other ways; and to increase intelligence and elevate the standards of living in the rural districts. For the attainment of these objects the college is authorized to give instruction in the sciences, arts, and practices relating thereto, in such cases and in such manner as shall best serve the interests of the state; to conduct extension work in disseminating agricultural knowledge throughout the state by means of experiments and demonstrations on farms and gardens, investigations of the economic and social status of agriculture, lectures, publications of bulletins and reports, and in such other ways as may be deemed advisable in the furtherance of the aforesaid objects; to make researches in the physical, chemical, biological, and other problems of agriculture, the application of such investigations to the agriculture of New York, and the publication of the results thereof."

THE BUILDINGS AND FARMS

The buildings. The buildings erected under the enactment of 1904 were first occupied in June, 1907. The central group then erected consisted of a main administration and classroom building, an agronomy building, and a dairy building, the three being connected by covered loggias. Subsequently the Legislature provided for the erection of two large barns, a greenhouse, a home economics building, a forestry building, a poultry husbandry building, a soils building, an auditorium, and a classroom building and stock judging pavilion for animal husbandry.

Other buildings included in the present equipment are a frame building that temporarily houses the Department of Rural Engineering, an insectary, a biological station in the marsh at the south end of Cayuga Lake, a fish breeding house in Cascadilla Creek, a seed storage house, and other small buildings on the farms.

The farms. The College of Agriculture has 909 acres of land, and it rents 195 acres additional, making a total of 1104 acres under college management. These farms are run not for commercial but for educational purposes, and the practices are therefore modified to meet the varied demands of the institution.

Land in the vicinity of the College is very broken, abounding in hills and dales, brooks and gorges. In consequence, less than one-half of the total area is now available for tillage. Of the 1104 acres, 567 are classified as arable, 304 as pasture, and 143 as wood and waste; 51 are devoted to college grounds, buildings, and old orchards, and 39 are retained for other uses.

Of the tillable area, 45 acres have been laid out in permanent experiment plots for the use of the Departments of Soil Technology and Plant Breeding; 50 acres have been assigned to the Department of Pomology and are largely planted to young trees; 45 acres have been assigned to the Departments of Floriculture and Vegetable Gardening; 73 acres to the Department of Poultry Husbandry; 15 acres to farm-crop gardens and experiments; and there are left to the Department of Farm Practice 339 acres on which to conduct the regular farm operations.

The soil of the college farms is heavy, nearly all of it being Dunkirk clay loam. A few fields at the extreme southeastern corner are Volusia stony loam. The Dunkirk clay loam is entirely unsuited to potatoes and is not well adapted to corn, but will grow fair crops of corn if heavily manured. It is well adapted to wheat, oats, timothy, and clover. The Volusia stony loam when well drained and freed from stones is well adapted to corn and potatoes. The recently acquired areas lack both these improvements.

EXPENSES

Tuition in the College of Agriculture is free to both graduate and undergraduate students who for a year or more immediately preceding matriculation have been residents of the State of New York. The annual tuition fee for students from outside the State is $125 for two terms. The tuition fee for the summer term is $62.50.

Other fees, required of all students, are as follows:

Matriculation fee	$ 5.00
Fee for baccalaureate degree	10.00

Deposit fees are required in various laboratory courses; inquiry concerning these should be made before registration. Students are liable to a special charge for breakage or damage resulting from their own carelessness. Attention is called to the expenses of excursions required in various courses.

The expense of textbooks, instruments, and other necessary articles varies from $10 to $75 a year.

There are many private boarding and rooming houses near the University campus. In these the cost of board and furnished room, with heat and light, varies from $5 to $12 a week. By the formation of clubs, students are sometimes able to reduce their expenses for room and board.

GENERAL INFORMATION CONCERNING COURSES

The regular instruction in the College of Agriculture constitutes a course of four years, or eight terms, leading to the degree of Bachelor of Science. There is a combined course with the State Veterinary College comprising seven years and leading to two baccalaureate degrees. Summer courses in agriculture, designed especially for teachers, school principals and superintendents, and college students, are offered in the six-weeks Summer Session of the University. Aside from these there are winter courses without University credit, and opportunities for students to pursue special work. Circulars describing the winter courses and the short summer courses may be obtained on application to the Secretary.

Students may pursue agricultural subjects in the Graduate School of the University. For full information concerning graduate work and degrees, see the Announcement of the Graduate School.

THE REGULAR FOUR YEAR COURSE

Men who are candidates for admission to the regular, or four year, course must be at least sixteen years of age; women must be at least seventeen years of age. They must have certificates of good moral character, and students from other colleges or universities are required to furnish from those institutions certificates of honorable dismissal. Students are admitted on examination, or on presenting credentials of the Education Department of the State of New York, or on acceptable school certificates.

Prospective students who have neither lived on farms nor had considerable practical experience in agriculture are urged to spend at least one year on a well-managed farm in order to familiarize themselves with common farm affairs and operations before entering the College. This experience is imperative in order to pass the farm-practice requirements.

Candidates for admission must file their credentials and obtain permits for examination at the University Registrar's office, Morrill 10. The results of examination may be ascertained from the Registrar.

ENTRANCE REQUIREMENTS FOR THE FOUR YEAR COURSE

The subjects that may be offered for admission are named in the following list; the figure in parenthesis following each subject indicates its value in units and shows the maximum and the minimum amount of credit allowed in the subject. A unit represents five recitations a week for one year in a study.

1a.	English No. 1	(1½)
1b.	English No. 2	(1½)
2a.	First Year Greek	(1)
2b.	Second Year Greek	(1)
2c.	Third Year Greek	(1)
3a.	First Year Latin	(1)
3b.	Second Year Latin	(1)
3c.	Third Year Latin	(1)
3d.	Fourth Year Latin	(1)
4a.	First Year German	(1)
4b.	Second Year German	(1)
4c.	Third Year German	(1)
5a.	First Year French	(1)
5b.	Second Year French	(1)
5c.	Third Year French	(1)
6a.	First Year Spanish	(1)
6b.	Second Year Spanish	(1)
6c.	Third Year Spanish	(1)
7a.	First Year Italian	(1)
7b.	Second Year Italian	(1)
7c.	Third Year Italian	(1)
8a.	Ancient History	(½–1)
8b.	Modern and Medieval History	(½–1)
8c.	American History, Civics	(½–1)
8d.	English History	(½–1)
9a.	Elementary Algebra	(1)
9b.	Intermediate Algebra	(½)
9c.	Advanced Algebra	(½)
9d.	Plane Geometry	(1)
9e.	Solid Geometry	(½)
9f.	Plane Trigonometry	(½)
9g.	Spherical Trigonometry	(½)
10.	Physics	(1)
11.	Chemistry	(1)
12.	Physical Geography	(½–1)
13.	Biology*	(1)
14.	Botany*	(½–1)
14a.	Zoology*	(½–1)
15.	Bookkeeping**	(½–1)
16.	Agriculture (including home economics)**	(½–4)
17.	Drawing	(½–1)
18.	Manual Training	(1)
19.	Any high school subject or subjects not already used	(½–1)

For admission to the New York State College of Agriculture, an applicant must offer either A or B as below:

A. Fifteen units arranged as follows: English (3), history (1), elementary algebra A (1), plane geometry (1), a foreign language† (3), elective (6). Solid geometry and plane trigonometry are recommended among the elective units for students entering the courses of forestry or landscape art.

B. The Arts College Entrance Diploma or the Science College Entrance Diploma issued by the Education Department of the State of New York.

Requirements for Admission of Special Students

Opportunities are provided for persons who desire to pursue special studies. In order to be eligible for admission to special work, applicants must offer two full years of recent farm experience and must also either have fifteen units of entrance credits or be twenty-one years of age. In addition, applicants for admission on the age requirement must satisfy the faculty of their ability to handle the work; and every applicant must satisfy the faculty of his bona fide desire for special study. He will be required to present an honorable dismissal from the school last attended, certificates of good moral character, and such other certificates and letters as may be desired. The special work is designed to meet the needs of young men and young women from farms who have not time for a four year course, and of mature persons who desire to spend a brief period in specialized study. The work is not a definite "course" in the sense of having a program or a prescribed set of studies. The student chooses any of the agricultural "electives" that he is fitted to pursue. Certain courses are given by some of the departments for students who lack some of the fundamental work usually required in those subjects. Admission as a special student does not admit to classes. The student is admitted to the various classes by the heads of the departments concerned.

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*If an applicant has counted Biology (1) he may not also offer Botany (½) or Zoology (½).

**An applicant may offer not to exceed four units in vocational subjects under numbers 16, 18, and 19 combined. Bookkeeping may not be offered together with more than one of the subjects listed under 16, 17, and 18.

†French or German is recommended for entrance. For the Graduate School requirement with reference to a reading knowledge of French and German, see page 6 of the Announcement of the Graduate School.

Requirements for Admission to the Summer Term

Applicants for admission to the summer term as regular students in the four year college course must, in addition to satisfying entrance requirements in full, have completed all the required work of the first two years of the regular course as outlined on pages 12–13, or the substantial equivalent thereof. Special students are admitted to the summer term on the same basis as to other terms, as recited above.

Other Details for Admission

For other details as to subjects and methods for admission, see the General Circular of Information, which may be obtained on application to the Secretary, Cornell University, Ithaca, New York.

For admission to advanced standing from other colleges and universities, all communications should be addressed to the Registrar of the University. See the General Circular of Information.

For admission as a special student, communications should be addressed to the Secretary, College of Agriculture, and attention is called to the paragraphs on pages 28 and 29 of the General Circular of Information.

For admission to graduate work and candidacy for advanced degrees, communications should be addressed to the Dean of the Graduate School.

Requirements for the Degree of Bachelor of Science

The requirements for the degree of Bachelor of Science shall be residence for eight terms, and, in addition to the prescribed work in the Department of Physical Culture and of Military Science and Tactics, the completion of one hundred and twenty hours of required and elective work as outlined on pages 12–13.

All men students, except those whose record and registration at the beginning of the senior year show that they are specializing to the extent of fifteen hours in home economics, forestry, that is, professional students in forestry, landscape art, or entomology, must fully satisfy, before the beginning of the senior year, the requirements in farm practice. All men students are required to report to the Department of Farm Practice within the first three weeks of the first term in the College.

A student admitted to the College of Agriculture from another college in Cornell University, or from any other institution of collegiate rank, will be regarded as having completed the number of terms and hours to which his records entitle him, and will receive all the privileges of students who have completed the same number of terms and hours by residence in the College. In order, however, to obtain the degree of Bachelor of Science, he must have completed the prescribed subjects in the four year course and the requisite number of elective hours in agricultural subjects. He must also have been in residence in the College of Agriculture for at least two consecutive terms and have completed not less than fifteen hours a term, of which two-thirds, at least, must be subjects taught by the staff of the College of Agriculture.

A student must register for at least twelve hours each term, and no new student may register for more than eighteen hours. Maximum registration by old students is determined on the basis of record.

Regular students may take at their discretion during their four years not to exceed twenty hours of elective subjects in courses offered in other colleges than Agriculture; but such elective subjects shall not interfere with required or back work. Special students must take at least two-thirds of the entire work of each year from subjects taught by members of the staff of Agriculture.

The Course Leading to the Degree of Bachelor of Science

Freshman year	Number of course	Hours 1st term	Hours 2d term
English	1	4	4
Chemistry	1	6	–
Chemistry	85 or 6	–	4 or 5
Biology	1	3	3
The Farm		2	–
Physics	2		5
Electives*		0–3	4–7
Total		15–18	15–18

Sophomore year	Number of course	Hours 1st term	Hours 2d term
Geology**	1	3	–
Chemistry***	85		4
Physiology,**** one of the following:			
Physiology of domestic animals	12	–	3
Human physiology	3	–	3
Plant physiology	20 or 21	–	4
Botany or	1	5	–
Zoology	1	5	–
Electives		7–10	6–11
Total		15–18	15–18

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*Professional students in forestry who do not offer solid geometry and plane trigonometry for entrance are required to take these subjects in their freshman year.

**Optional for students taking a major in home economics.

***Required of students taking Chemistry 6 in the freshman year.

****May be taken in junior or senior year by special permission.

In addition to the above, the required work in military drill and physical training must be taken.

Political Science 51 may be taken this year.

Junior year	Number of course	Hours 1st term	Hours 2d term
Political Science	51	3	3

Elective Subjects and Group Requirements

The remainder of the work is made up of electives to be taken under the following restrictions:

A student may take at his discretion during his four years not to exceed twenty hours of elective subjects in courses offered in other colleges than Agriculture; but such elective subjects shall not interfere with required or back work. The remainder of his elective work must be offered from subjects taught by members of the staff of Agriculture.

In selecting the subjects in the major group in Agriculture, the student must obtain the advice and approval of a professor or an assistant professor having charge of a subject within the group and preferably within the department in which he expects to specialize, who shall be chosen by the student at the beginning of the sophomore year. Students expecting to specialize in forestry, landscape art, home economics, or rural education must take as their advisers professors or assistant professors in those departments.

All students must have passed before graduation at least fifteen hours of agricultural electives in one of the groups named below, and at least three hours in each of three of the other groups:

Group A—Farm Crops
Pomology
Soil Technology
Floriculture
Vegetable Gardening
Group B—Animal Husbandry
Poultry Husbandry
Dairy Industry
Entomology
Group C—Agricultural Chemistry
Botany
Plant Breeding
Plant Pathology
Meteorology
Group D—Rural Economy
Rural Education
Farm Management
Extension
Rural Engineering
Drawing
Group E—Forestry
Home Economics
Landscape Art

DEPARTMENTS OF INSTRUCTION

BOTANY

6a. **Taxonomy of the Higher Plants.** Credit four hours. Prerequisite course I or its equivalent. Lectures, M, 9. Roberts Hall 292. Laboratory, W, 8–1, 2–5. Agronomy Building, Botanical Laboratory. Remainder of the work by appointment. Professor WIEGAND and Mr. METCALF.

Identification, classification, and ecology of the seed plants and ferns: a detailed study of the local flora about Ithaca with reference to the identification of species and varieties, to the classification and nomenclature of local plants, and to a study of their floral and foliar characteristics. The course consists largely of field and laboratory work, but is supplemented by general discussions and lectures on the broader questions of classification, nomenclature, distribution, and habitat. The ecological associations and modifications of the various species and varieties will be noted. Instruction will be given in the preparation of an herbarium and in the preparation of keys. Laboratory fee, $3.50.

7. **Weeds and Weed Seeds.** Credit two hours. Prerequisite course I or its equivalent. Lectures, M, 11. Laboratory, Th, 2–5. Agronomy Building, Botanical Laboratory. Professor WIEGAND and Mr. METCALF.

This course is designed to meet the needs of students of agriculture who wish to obtain a working knowledge of weeds and weed seeds. It will also aid persons intending to teach nature study and agriculture in the schools. Laboratory fee, $1.50.

9. **Histology.** Credit four hours. Prerequisite course I or its equivalent. Lectures, F, 11. Laboratory, T Th F, 8–10.30. Agronomy Building, Botanical Laboratory. Assistant Professor EAMES and Mr. MACDANIELS.

This course is designed to give a knowledge of the structure and morphology of plant tissues and organs. Emphasis will be placed on the relation of structure to function, and on the modifications due to phylogenetic development and to ecological factors. Traumatic and pathogenic tissues, and the effect of parasitism, symbiosis, and other factors on the various tissues, will be studied. Laboratory work will include methods and practice in microtechnique. Laboratory fee, $5.

18. **Research in General Botany, Histology, and Taxonomy.** Credit not less than three hours, by appointment. Professor WIEGAND and Assistant Professor EAMES.

A course designed for graduates and advanced students. Original investigation by students who are adequately prepared. The laboratory fee depends on the nature of the work.

19. **Seminary in Taxonomy, Morphology, Cytology, and Histology.** Credit one hour. Credit restricted to graduate students in the Department. Hours to be arranged. Professor WIEGAND.

Broad problems pertaining to botany will be discussed, literature will be reviewed, and reports of research will be given.

21a. **Plant Physiology, Advanced Course.** Credit five hours. Prerequisite training in botany and chemistry, to be determined in each case by the instructor. Lectures, M F, 8 (at 7 if the class so desires). Agronomy Building 192. Laboratory, M F, 10–1. Assistant Professor KNUDSON.

Topics include nutrition, osmotic pressure, permeability, absorption, conduction, transpiration, toxicity, and photosynthesis. Laboratory fee, $6.

21b. **Plant Physiology, Advanced Course.** Credit five hours. Prerequisites as for 21a. Lectures, T Th, 8 (at 7 if the class so desires). Agronomy Building 192. Laboratory, T Th, 10–1. Assistant Professor KNUDSON.

Topics include metabolic products, digestion, translocation, respiration, fermentation, growth, stimulation, reproduction, and plant response. Laboratory fee, $6.

These two courses are the equivalent of course 21, the credit for which is five hours in both fall and spring terms. The present division into two courses is arbitrary, one course representing the work of the fall term and the other representing that of the spring term. These courses are designed primarily for advanced or graduate students, and especially for those specializing in plant study. Lectures and laboratory work are supplemented by written reports. Students may take both 21a and 21b in the third term, or either may be taken alone.

30. **Special Chapters in Metabolism.** Credit one hour or more. Lectures and laboratory. Assistant Professor KNUDSON.

A study of some of the more important temporary and storage products of plant metabolism. Open only to graduates, or to undergraduates who have had course 21 and organic chemistry.

31. **Seminary in Plant Physiology.** Credit one hour. Limited to graduates taking work in the Department. Conferences, hours to be arranged. Agronomy Building 192. Assistant Professor KNUDSON.

Topics will be chosen from current work in plant physiology.

33. **Research, Plant Physiology.** Credit for major or minor, otherwise not less than four hours. Prerequisite adequate training in botany, chemistry, and physiology. By appointment. Agronomy Building 101. Assistant Professor KNUDSON.

Problems in plant physiology and in the general relation of plant physiology to agriculture will be assigned for investigation. Reports on these will be required. The amount of the laboratory fee is governed by the nature of the work.

DRAWING

2b. **Free-hand Drawing and Outdoor Sketching.** Credit two to five hours. Lectures during practice. Practice by appointment. M W F S, 8–12, T Th, 2–5. Dairy Building 371. Professor BAKER.

While this course is designed more particularly to meet the needs of the students of landscape art, being out-of-door study of foliage, tree-growth, and architecture, provision is also made for the needs of the general student of free-hand drawing and of teachers of the subject in the secondary schools.

ENTOMOLOGY, LIMNOLOGY, AND NATURE STUDY

2. **The Ecology of Insects.** Credit three hours. One lecture and two practical exercises, largely field work. Lectures, W, 8. Roberts Hall 392. Practical exercises, one W, 10–12.30, and one by appointment. Professor NEEDHAM and Messrs. LLOYD and LOBDELL.

A general course in the study of the lives of insects in relation to their environment. Practical studies will be made of the activities of insects and of the rôle that they play in different natural associations. Observations will be made on the relations between their structures and instincts and the situations in which they live, and on many of the ways in which they find a living and establish homes. Laboratory fee, $2.50

3. **General Entomology.** Credit three hours. Prerequisite course 1 or Zoology 1. Lectures, M W, 9. Roberts Hall 392. Practical exercises, W Th, 2–4.30. Roberts Hall 392. Assistant Professor MATHESON and Mr. FROST.

Lectures on the characteristics of orders, suborders, and the more important families, and on the habits of representative species. The practical exercises include a study of the structure of insects and practice in their classification. The lectures only (credit two hours) are taken by those who have had courses 4 and 5. When possible the laboratory work will utilize materials collected by the student in the field. Laboratory fee, $1.50.

4. **Elementary Morphology of Insects.** Credit four hours. Th, 9, and eleven additional hours by appointment. Roberts Hall 391. Assistant Professor BRADLEY and Mr. HESS.

An introductory laboratory course required of all students planning to take advanced work in entomology. Includes an introduction to the method of phylogenetic study as illustrated by the wings of insects (formerly included in course 5). Laboratory fee, $3.

Students who wish to take course 5 during the term in which they are taking this course may complete course 4 during the first twelve weeks of the term by taking fifteen hours a week.

5. **Elementary Systematic Entomology.** Credit one or two hours. Prerequisite course 4. Th F, 10–1. Roberts Hall 301. Assistant Professor BRADLEY and Mr. ———.

Practice in the identification of insects.

The completion of forty-five or ninety hours of work in the laboratory will be required. Laboratory fee, $2 or $3.

This course may most advantageously be taken in combination with course 10.

Course 4 and one hour of course 5 are required of all students who plan to take advanced work in entomology. They may both be taken in one term by taking fifteen hours of work a week in the laboratory and thereby completing course 4 during the first twelve weeks of the term.

10. **Entomotaxy.** Credit two or three hours. Prerequisite course 4, should be accompanied by course 5. Laboratory and field work, W F, 2–5, and for three-hour students, Th or F, 10–1. Roberts Hall 301. Assistant Professor BRADLEY.

Methods of collecting insects and of preserving them for study and the cabinet, together with other matters of technique. Practice in the identification of the insects of the local fauna. Two all-day field trips will be required.

A week of field work open to students in this course will be arranged for those who wish it. During the summer of 1916 this will be held August 21–28 in the Adirondack Mountains.

12. **Taxonomy of Insects.** Credit four hours. Prerequisite courses 3, 4, 5, 11, 14, and 20, and preferably 10. Lectures, F, 8. Laboratory, F, 10–1, and two other periods of three hours each to be arranged. Assistant Professor BRADLEY, Professors NEEDHAM, JOHANNSEN, and W. A. RILEY, Assistant Professor MATHESON, Mr. LLOYD, and cooperating specialists.

This course will continue throughout a number of terms, but the work of each term may be elected independently. The course is intended primarily for graduate students who desire a systematic survey of one or more of the orders of insects.

F. Neuropteroids. Professors NEEDHAM and BETTEN, and Messrs. LLOYD and NAKAHARA.

[I. Hymenoptera. Assistant Professor BRADLEY. Summer of 1917.]

19. **Research in Systematic Entomology.** Credit three or more hours a term. Prerequisite courses 3, 10, 11, 14, 20,* and one term of course 12. Laboratory hours by arrangement. Roberts Hall 301. Assistant Professor BRADLEY, Professors NEEDHAM and JOHANNSEN.

29. **Research in Morphology of Insects.** Credit three or more hours. Prerequisite courses 3, 4, and 5. Laboratory open daily except S, 8–5; S, 8–1. Roberts Hall 391. Professors W. A. RILEY and NEEDHAM.

Special work arranged with reference to the needs and attainments of each student. Laboratory fee, $1.50 an hour.

40. **Advanced Economic Entomology and Insectary Methods.** Credit three hours. Open only to graduates. Seminary, T, 2–4.30. Field and laboratory work by appointment. Insectary. Assistant Professor MATHESON.

Economic problems connected with applied entomology will be discussed and reported on, and field observations will be made. Experimental methods in breeding, photographing, investigating, and controlling insects will be discussed and studied. Designed for advanced students in entomology who desire to fit themselves for experiment station work. Laboratory fee, $2.50.

49. **Research in Economic Entomology.** Credit three or more hours. Prerequisite courses 3, 4, 5, 11, and 14.* Laboratory and field work by appointment. Insectary. Professor HERRICK and Assistant Professor MATHESON.

In most cases it is impracticable to complete an investigation in this subject during the college year. Students must arrange to conduct their observations during the growing season.

50. **General Limnology.** Credit three hours. Open only to students who have taken or are taking course 3 and Biology 1, or the equivalent. Lectures, Th, 8. Roberts Hall 392. Laboratory, one Th, 2–4.30, and one by appointment. Roberts Hall 492. Professor NEEDHAM and Mr. LLOYD.

An introduction to the study of the life of inland waters. Aquatic organisms in their qualitative, quantitative, seasonal, and ecological relations. Laboratory fee, $2.50.

59. **Research in Limnology.** Credit three or more hours. Prerequisite course 50 or its equivalent. Laboratory and field work by appointment. Roberts

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*For courses not given during the summer term, see the regular announcement for the academic year.

Hall 492 and Biological Field Station. Professors NEEDHAM and W. A. RILEY, and Assistant Professor EMBODY.

Seminary. M, 4.30–5.30. Roberts Hall 392.

The work of an entomological seminary is conducted by the Jugatæ, an entomological club which meets for the discussion of the results of investigations.

Summer Field Trip. A summer field trip will be held August 21–28, 1916, in the Adirondack Mountains. This trip is designed primarily for students in entomotaxy course 10 but will be open by permission to all graduates and properly qualified undergraduates in the Department who can make satisfactory arrangements for the carrying forward of their regular work.

FARM CROPS

2. **Farm Crops, Advanced Course.** Credit four hours. Prerequisite course 1. Lectures, M T W, 8. Roberts Hall 292. One recitation per week to be arranged. Professor MONTGOMERY.

The object of this course is to study the more important principles of crop production, based on experimental evidence. Both cereal and forage crops are studied. An effort is made to acquaint the student with the best sources of literature, especially the work of experiment stations. About six hours per week reference reading is required.

FARM MANAGEMENT

2. **Farm Management.** Credit four hours. Open to students who have passed the farm practice examination. This course is designed for students who have had considerable farm experience. It should be taken near the end of the student's college course. Lectures, M W F, 10. Dairy Building 222. One laboratory period a week, T, 2–4.30. Farm Management Building 102. On days when farms are visited, laboratory work may last longer than two and one-half hours. Professor LIVERMORE.

Lectures, recitations, and laboratory practice. Farming as a business; labor income; size, diversity, and production of business; regions and types of farming; cropping systems; farm layout; building arrangement; efficient use of labor, horses, and machinery; marketing; forms of tenures and leases; organization and management of successful farms; ways of starting farming; use of capital and credit; choosing and buying a farm; planning, organization, and management of specific farms. A one-day excursion to farms at some distance from Ithaca will be made about September 5. Laboratory fee, $1.

FARM PRACTICE

1. **Farm Practice.** Without credit toward graduation. Hour and place by appointment. Professor KING and Mr. MOULTON.

An elective course designed to assist students in meeting the requirements in farm practice demanded by the College. In order to meet these requirements, students must have a practical knowledge of horses, cattle, sheep, swine, poultry, crops, farm machinery, orcharding, gardening, butter and cheese making, and the like. All men students except those whose record and registration at the beginning of the senior year show that they are specializing to the extent of fifteen hours in home economics, forestry, landscape art, or entomology, must fully satisfy, before the beginning if the senior year, the requirements in farm practice. The Department of Forestry requires three months of forestry practice in lieu of the farm practice requirement. All men students are required to report to the Department of Farm Practice as assigned within the first three weeks of their first term in the College.

FLORICULTURE

3. **Commercial Floriculture.** Credit four hours. Prerequisite course 1 or commercial experience, and course 2. Lectures and recitations, M W F, 9. Practice, W, 2–4.30. Greenhouses. Assistant Professor Lumsden.

Studies in the propagation and culture of florists' crops. As far as possible practical work will be given in the propagation and culture of roses, carnations, violets, orchids, and other plants grown for commercial purposes. Methods of packing, shipping, and marketing will be considered. Laboratory fee, $2.

5. **Greenhouse and Garden Practice.** Credit one or two hours. Prerequisite course 1, and permission to register. Practice by appointment. Greenhouses and gardens. Mr. Thayer.

Designed to give students a wider experience in the practice of flower growing. The course consists of practical work in all branches of greenhouse management. Reports of work done are required.

8. **Garden Flowers.** Credit three hours. Lectures, T Th, 9. Practice, T or Th, 2–4.30. Greenhouses and gardens. Assistant Professor Lumsden and Mr. Thayer.

A study is made of the identification, propagation, and culture of annuals, herbaceous perennials, and roses. It is aimed to give the student an intimate knowledge of those forms of annual and herbaceous plants that may be used in garden planting either on home grounds or in public parks. An excellent collection of plant material is available for demonstration work in this course. All members of this class will be required to participate in an excursion to the Thompson estate at Canandaigua on August 12. Laboratory fee, $2.

8a. **Grouping and Arrangement of Annuals and Herbaceous Perennials.** Second and third terms, credit two hours a term. Prerequisite course 8 and Botany 1. Lectures, S, 9. Practice, S, 10.30–1. Assistant Professor Lumsden.

A study of the principles and methods of arrangement of garden flowers in the border and flower garden. The planting of borders for a continuous display of bloom throughout the season. Æsthetic taste in color arrangement will also be studied. Laboratory fee, $2.

9. **Amateur Floriculture.** Credit two hours. Lectures, F, 9. Practice, S, 10.30–1. Greenhouses. Mr. Thayer.

The propagation and culture of potted plants in the home—plants suitable for window gardening and for outdoor home gardening. The course includes a study of containers, soils, fertilizers, and insecticides; also the preparation and planting of flower beds. It is planned primarily for students who are interested especially in home economics, but is open to any one desiring information regarding simple methods of plant culture. Laboratory fee, $2.

12. **Investigation in Floriculture.** Credit, one, two, or three hours. Prerequisite courses 1, 3, and 4, and permission to register. Designed primarily for upperclassmen and graduate students. Consultation by appointment. Professor Beal and Assistant Professor Lumsden.

The investigation of problems in growing flowers for cutting, exotics, garden flowers, and the like.

FORESTRY

The first six weeks of the summer term will be spent at Ithaca; the remainder of the term will be spent in camp on a forest tract, in Saratoga County in the summer of 1916.

The following courses of instruction will be offered:

Group A

Forestry 9	Forest Utilization
Forestry 11	Forest Mensuration
Forestry 14	Silviculture: Forest Ecology
Forestry 15	Silviculture: Natural Reproduction and Care of the Forest

Group B

Forestry 20	Forest Management
Forestry 22	Seminary
Forestry 23	Advanced Work
Forestry 24	Research

For the professional forestry student, the courses in Group A will constitute the first term's work of the senior year. During the following term, these students are expected to obtain the required practical experience, returning to Ithaca to complete undergraduate work in the second term. Courses in Group B are offered for graduate students.

Courses 9, 11, 14, 15, and 20 will hereafter be given for professional forestry students during the third, or summer, term only, because of the obvious advantages of the season and place of work.

In the following program, the designated hours and rooms apply to work in Ithaca. A special camp schedule is to be arranged.

9. **Forest Utilization.** Credit four hours. Lectures, M T W Th F, 11. Forestry Building 122. Practice in forestry camp latter part of term. Professor Recknagel.

The principal industrial uses of timber; logging methods and equipment; logging in representative regions; manufacture of lumber; determination of stumpage values; timber sale contracts; timber sale administration, including marking, brush disposal, and scaling in practice; minor industries; utilization of forest products other than wood, as grazing range, fish and game, and the like.

11. **Forest Mensuration.** Credit five hours. Lectures, M T W, 8. Forestry Building 126. Practice, M, 2–4.30. Forestry Building 118, and in camp. Assistant Professor Bentley.

Measurement of logs and standing timber; timber cruising; study of the rate of growth of timber; volume and yield tables. Laboratory fee, $1.50.

14. **Silviculture: Forest Ecology.** First six weeks. Credit three hours. Prerequisite Botany 1 or its equivalent. Lectures, M T W Th F, 10. Forestry Building 122. Practice, W, 2–4.30, S, 8–1. Forestry Building 8. Professor SPRING.

The influence of site on the forest and of the forest on site; the behavior of trees as members of a forest community. Laboratory fee, 50 cents.

15. **Silviculture: Natural Reproduction and Care of the Forest.** Last ten weeks. Credit three hours. Prerequisite courses 13 and 14. Lectures and practice to be arranged. Professor SPRING.

A technical discussion of the silvicultural systems as practiced in Europe, and the possibility of using them in each of the forest regions of the United States and Canada; improvement cuttings, thinning and underplanting; marking timber for cutting.

20. **Forest Management.** Credit five hours. Open only to graduate students. Lectures, daily, 9. Forestry Building 126. Practice in forestry camp. Professor RECKNAGEL.

Forest organization, including foundations of working plans; regulation of yields, and the formulating of working plans; forest finance, including forest valuation (the ascertainment of values) and forest statics (the comparison of values).

22. **Seminary.** Credit two hours. Open only to graduate students. Hours to be arranged. Forestry Building 126. Professors HOSMER, SPRING, and RECKNAGEL, and Assistant Professor BENTLEY.

23. **Advanced Work.** Credit two or more hours. Open to undergraduate and graduate students who have had the necessary training. Hours by appointment. Professors HOSMER, SPRING, and RECKNAGEL, and Assistant Professor BENTLEY.

Individual advanced study of designated topics.

24. **Research.** Credit three or more hours. Open only to graduate students who have had the necessary training. Hours by appointment. Professors HOSMER, SPRING, and RECKNAGEL, and Assistant Professor BENTLEY.

LANDSCAPE ART

13. **Elements of Planting Design.** Credit five hours. Prerequisite Botany 1. Lectures, M, 8. Practice and field trips with criticism, M F, 10–1 and 2–5. Landscape Art Building. Assistant Professor CURTIS.

A study of the identification and characteristics of trees, shrubs, and vines used in landscape planting, together with the elementary principles of their composition.

This work has been planned in consultation with the Departments of Drawing and Floriculture, so that a total registration of 13 hours may be secured as follows: Floriculture, 3 hours; Drawing, 5 hours; Landscape Art, 5 hours. This instruction enters into the regular Landscape Art schedule and carries full-term credit toward graduation. Laboratory fee, $1.

PLANT BREEDING

6. **Plant Breeding, General Course.** Credit four hours. Prerequisite Biology 1 and Botany 1. Lectures, W F, 9. Recitations, M, 9. Forestry Building 210. Laboratory, M, 2–4.30. Forestry Building 206. Assistant Professor Barker and Mr. Fraser.

A general introductory course treating of variation, the laws of heredity, and selection. Equivalent to courses 1 and 2. Laboratory fee, $3.

13. **Plant Breeding, Advanced Course.** Credit three hours. Prerequisite course 8. Lectures, T Th, 9. Forestry Building 210. Laboratory, W, 2–4.30. Assistant Professor Barker and Mr. Fraser.

An advanced course for seniors and graduates treating of the philosophy of variation and evolution, the laws of heredity, and the experimental methods of research. Laboratory fee, $3.

PLANT PATHOLOGY

1. **Plant Pathology.** Credit one, three, or four hours. Prerequisite Botany 1 and 20 or equivalents. Lecture, credit one hour, Th, 10. Roberts Hall 292. Must accompany or follow recitations and practice. Recitations and laboratory periods in limited sections as follows:

General agricultural section: Credit three hours. Recitation, F, 12. Agronomy Building 192. Practice, W F, 2–4.30. Bailey Hall, West Basement.

Pomology section: Credit three hours. Recitation, F, 12. Roberts Hall 292. Practice, Th, 2–4.30, S, 8–10.30. Bailey Hall, West Basement.

Professor Whetzel, Assistant Professor Hesler, and Messrs. Chupp and Braun.

A fundamental course treating of the nature, cause, and control of plant diseases, illustrated by studies of the commoner diseases of cultivated crops. Students specializing in those lines indicated by the names of the sections will be expected to schedule their work accordingly. The practice work must be taken in the couplets announced above. Practice sections limited to twenty-four students each. Laboratory fee, $4.50; breakage deposit, $2.

2. **Principles of Plant Disease Control.** Credit three hours. Recitation, Th, 12. Home Economics Building 100. Practice, Th, 2–4.30, S, 10.30–1. Bailey Hall, West Basement. Professor Whetzel, Assistant Professor Hesler, and Messrs. Chupp and Braun.

A consideration of the principles and the methods of control of plant diseases. This will include studies on: exclusion by laws, regulations, quarantine, and inspection; eradication by pruning, seed selection, tree surgery, rotation, disinfection, and other means; protection by spraying, dusting, wound dressing, and the like; immunization by selection, breeding, feeding. The practice sections must be taken in the couplets announced above. Laboratory fee, $4.50; breakage deposit, $2.

6. **Cryptogamic Parasites.** Credit three hours. Prerequisite Botany 1 or equivalent and permission to register. Not offered to a class of less than five students. Lectures, T, 11. Home Economics Building 100. Practice, M T, 2–4.30. Bailey Hall, East Basement. Assistant Professor Hesler and Mr. Braun.

Comparative studies of the morphology, life history, and classification of parasitic fungi, slime moulds, and bacteria. A general introductory course in mycology for undergraduates. Laboratory fee, $4,50; breakage deposit, $2.

20. **Research.** Credit not less than three hours. Professor WHETZEL, and Assistant Professors STEWART and HESLER. Laboratory fee, $1.50 per hour.

POMOLOGY

10. **Systematic Pomology.** Credit two hours. Prerequisite courses 1, 1a, and 8, and Botany 1. Lectures or recitations, F S, 8. Roberts Hall 292. After August 15, a laboratory period, S, 8–10.30, is substituted for the Saturday lecture. Messrs. HEINICKE and CARRICK.

A study of the botanical and physiological characteristics of all species of fruit-bearing plants, with special reference to their cultural requirements.

The characteristic cultural methods of each fruit not discussed in a previous course are considered. Each student is required to collect and mount specimens of a number of varieties and species.

19. **Research.** Credit from one to three hours. Open to graduate or other students who have had courses 10, 12, and 12a, Botany 1 and 20, Plant Pathology 1, Entomology 3, and Chemistry 1 and 30 or 32. Professor CHANDLER and Mr. HEINICKE.

POULTRY HUSBANDRY

1. **Poultry Husbandry.** Credit three hours. Lectures, T Th, 11. Poultry Building 375. Practice, W, 2–4.30. Poultry Building 300. Professor RICE, Assistant Professor BENJAMIN, and Messrs. KENT, DANN, and HEUSER.

An introductory and prerequisite course for students desiring to take specialized courses in poultry husbandry. Those desiring a general course should see courses 2a, 3, 3a, and 10. The course includes the anatomy and physiology of poultry; the study of the egg; embryology; nomenclature; bibliography; environmental conditions; the history and scope of poultry husbandry.

2a. **Flock and Plant Management.** Credit one hour. Must be preceded or accompanied by course 2 or 10, and preferably also by Animal Husbandry 1. Practice periods and extra time arranged by appointment. Practice, three short periods a day, including Sunday, for four weeks: morning, 7.45–8.30; noon, 12.45–1.15; night, 4.30–5. Poultry Building. Messrs. DANN and ANDREWS.

Record keeping, and management of fowls for egg production and for fattening, including preparation for market. Assigned reading and a written examination will be required.

3. **Incubator Practice.** Credit one hour. Must be preceded or accompanied by courses 1 and 1a, or by course 10. Practice periods and extra time arranged by appointment. Practice, three short periods a day, including Sunday, for four weeks: morning, 7.45–8.30; noon, 12.45–1.15; night, 4.30–5. Poultry Building. Professor RICE and Mr. BUCHAN.

Practice in operating incubators; testing eggs, keeping records, and taking apart and setting up machines. Assigned reading and a written examination will be required.

3a. **Brooder Practice.** Credit one hour. Must be preceded or accompanied by courses 1 and 1a, or by course 10. Practice period and extra time arranged by appointment. Practice, three short periods a day, including Sunday, for four weeks: morning, 7.45–8.30; noon, 12.45–1.15; night, 4.30–5. Poultry Building. Professor RICE and Mr. BUCHAN.

The management of a brooder and a flock of chickens; the keeping of temperature, food, and growth records. Assigned reading and a written examination will be required.

7a. **Marketing Practice.** Credit one hour. Prerequisite course 7 and permission to register. Discussion hour, T, 4.45–5.45. Poultry Building 325. Practice periods arranged by appointment. Poultry Building 100. Assistant Professor BENJAMIN and ———.

This course is to accompany or supplement course 7 for those who desire additional instruction in the handling of poultry products and refrigeration machinery, and in general salesroom work.

10. **Farm Poultry.** Credit three hours. Lectures, M W, 11. Poultry Building 375. Laboratory, M, 2–4.30. Poultry Building 300. Professor RICE, Assistant Professor BENJAMIN, and Messrs. KENT, DANN, and HEUSER.

Not open to students who have taken any other course in poultry husbandry, except by special permission.

A brief course dealing with the practical application of the principles of poultry husbandry. For persons who do not specialize in this subject.

11. **Undergraduate Conference.** Credit one hour. Prerequisite course 8 and permission to register. M, 4.45–5.45. Poultry Building 325. Professor RICE, Assistant Professor BENJAMIN, and Messrs. KENT and DANN.

Round-table discussion of poultry literature and current problems of interest to the advanced student of poultry husbandry, including critical examinations of experiment station literature and research methods relating to poultry. Written reports will be required on many of the subjects discussed.

11a. **Seminary.** For graduate students only; required of all graduate students in poultry husbandry. M, 7.30–9.30 p. m. Poultry Building 325. Members of the departmental staff.

12. **Research.** Credit one to three hours. Must be preceded or accompanied by courses 8 and 11. Time arranged by appointment. Poultry Building. Professor RICE, Assistant Professor BENJAMIN, and Messrs. KENT and DANN.

An original investigation of a problem in poultry husbandry to be presented as a written thesis.

RURAL EDUCATION

1. **Agriculture in the High School.** Credit three hours. Open to seniors and juniors who have completed the prerequisites in education. Lectures, T Th S, 12. Practice, S, 8–10.30. Caldwell Hall 282. Professor WORKS and others.

A study of the purposes of vocational agriculture, organization and presentation of subject matter, textbooks, and home-project and extension activities of the high school. Course will be given if there is sufficient demand.

RURAL ENGINEERING

3. **Farm Mechanics.** Credit three hours. Students are urged to take Drawing 1 in preparation for this course. Lectures, W, 12. Caldwell Hall 100. Recitations, F, 8. Forestry Building 126. Practice, F, 2–4.30. Rural Engineering Building. Professor H. W. Riley and Mr. Hazen.

A study of the principles of operation, the details of construction, and the practical operation and care of: machinery, including gasoline engines, devices for transmitting power, hydraulic rams, pumps, spray nozzles, spraying outfits, water-supply outfits; implements, including mowers and binder attachments, with a discussion of the special mechanical features of some of these implements now on the market. Laboratory fee, $2.

19. **Research in Farm Mechanics.** Credit one or more hours. Prerequisite course 3 or its equivalent, and permission to register, together with natural ability in mechanical practice. Professor H. W. Riley.

Special work in farm mechanics on problems under investigation by the Department or of special interest to the student, provided, in the latter case, that the Department can furnish adequate facilities.

20. **Farm Engineering.** Credit three hours. Prerequisite plane geometry; students are urged to take Drawing 1 in preparation for this course. Lectures, T Th, 10. Caldwell Hall 143. Practice, W, 2–4.30. Caldwell Hall 400. Mr. Strahan.

A study of the practical solution of the elementary problems involved in connection with surveying and mapping the farm; locating, digging, and laying drains; laying out building foundations and farm water-supply and sewage disposal systems. From the data obtained in the field a contour map will be drawn for one of the fields near the College. Attention will also be given to concrete construction, the design of simple structures, and estimates of their cost. Laboratory fee, $2.

28. **Farm Engineering, Advanced Course.** Credit two or more hours. Prerequisite course 20 or its equivalent, and permission to register. Lectures, M, 8. Caldwell Hall 250. Practice, one problem as assigned. Mr. Strahan.

30. **Farm Structures.** Credit three hours. Prerequisite Drawing 1 or its equivalent. Lectures, T Th, 12. Caldwell Hall 400. Practice, S, 8–10.30. Rural Engineering Building. Mr. Hazen.

A study of building materials used on the farm; the principles of construction for barns, stables, and other farm buildings, and their application in practice.

SOIL TECHNOLOGY

1. **Principles of Soil Management.** Credit three hours. Prerequisite Chemistry 1 and Geology 1. Lectures, T Th, 9. Caldwell Hall 100. One laboratory period a week, M or W, 2–4.30. Caldwell Hall 49. One recitation a week, M, W, or F, 10. Caldwell Hall 143. Students must consult the Department in regard to laboratory and recitation appointments before registering for the course. Assistant Professor Buckman.

A comprehensive course dealing with the origin, composition, and properties of soils, with particular reference to their management in crop production. The laboratory work will consist in practice designed to demonstrate fundamental physical relations. Laboratory deposit, $3.

5. **Soil Surveying.** Credit two hours. Prerequisite course 1 and Physical Geography 5. Practice by appointment. Field, and Caldwell Hall 143. Assistant Professor Buckman.

A course designed to provide the practical, as well as the technical and theoretical, phases of soil survey. The preparation of maps and reports will be a feature of the course. Detailed as well as extended soil mapping will be studied. A good knowledge of glacial geology is necessary for this work.

11. **Research.** For graduate students only. By appointment. Caldwell Hall. Professor Bizzell. Three graduate students may register for their major subjects with Professor Lyon.

14. **Seminary.** Without credit toward graduation. Open to seniors who have had course 6, and required of graduate students. Caldwell Hall. Professors Lyon, Fippin, Bizzell, and Assistant Professors Buckman and Wilson.

VEGETABLE GARDENING

3. **Commercial Vegetable Gardening.** Credit four hours. Open only to students who have had the work of the second term. Lectures, T Th, 8. Practice, T Th, 10–1. Poultry Building 325, vegetable greenhouses, and gardens. Messrs. Work and Kenerson.

The time of this course corresponds with the growing season for the crops, and the student is in touch with plantings of the leading vegetables in the departmental gardens. This affords excellent practice in the care, harvesting, and marketing of the products. Each student is assigned a small garden plot which he cares for throughout the term. Several short excursions are made to near-by market gardens. There will be a one-, two-, or three-days trip to some of the most important vegetable-growing centers in the State, the cost of which will be $10 to $15; exact date to be arranged. Laboratory fee, $2.

5. **Systematic Vegetable Crops.** Credit three hours. Prerequisite course 3, or in special cases course 2, and permission to register. Lecture, T, 9. Poultry Building 325. Laboratory, Th F, 2–4.30. Vegetable gardens at East Ithaca. Messrs. Work and Kenerson.

Lectures and descriptive studies dealing with vegetable crops, their origin and botany. Special attention will be given to the varieties of the different vegetables, to their characteristics and their adaptation to different cultural and market conditions, and to judging and exhibition work. The important commercial types of different vegetables are grown in the garden each year and there is an abundance of first-hand material for the course. A judging trip to State Fair at Syracuse will be required. Each student makes a special systematic study of a crop or a group of crops, and presents a typewritten and bound report. Laboratory fee, $2.

6. **Practice.** One or two hours, without credit toward graduation. Prerequisite permission to register. By appointment. Messrs. Work and Spiegel.

Opportunity will be offered for a few students who are specializing in vegetable gardening to obtain practice in greenhouses and gardens.

7. **Vegetable Gardening, Advanced Course.** Credit two or more hours, by arrangement. Prerequisite course 3 and permission to register. Poultry Building 232. Mr. Work and assistants.

A special problem, to be arranged; occasional short excursions. A typewritten and bound report of the special problem is required. Laboratory fee according to the nature of the problem.

OFFICIAL PUBLICATIONS OF CORNELL UNIVERSITY

Issued at Ithaca, New York, monthly from July to November inclusive, and semi-monthly from December to June inclusive.

[Entered as second-class matter, August 31, 1910, at the post office at Ithaca, New York, under the Act of July 16, 1894.]

These publications include

- The Annual Register (for the year 1915–16, published January 1, 1916, price 50 cents.
- Book of Views, price 25 cents.
- Directory of Faculty and Students, Second Term, 1915–16, price 10 cents, and the following informational publications, any one of which will be sent gratis and post-free on request. The date of the last edition of each publication is given after the title.
- General Circular of Information for Prospective Students, December 15, 1915.
- Announcement of the College of Arts and Sciences, May 1, 1915.
- Announcement of Sibley College of Mechanical Engineering and the Mechanic Arts, January 15, 1916.
- Announcement of the College of Civil Engineering, March 15, 1916.
- Announcement of the College of Law, June 1, 1915.
- Announcement of the College of Architecture, August 1, 1915.
- Announcement of the New York State College of Agriculture, July 1, 1915.
- Announcement of the Winter Courses in the College of Agriculture, September 1, 1915.
- Announcement of the Summer Term in Agriculture, April 1, 1916.
- Announcement of the New York State Veterinary College, June 15, 1915.
- Announcement of the Graduate School, February 1, 1916.
- Announcement of the Summer Session, March 1, 1916.
- Annual Report of the President, November 1, 1915.
- Pamphlet on prizes, samples of entrance and scholarship examination papers, special departmental announcements, etc.

Announcement of the Medical College may be procured by writing to the Cornell University Medical College, Ithaca, New York.

Correspondence concerning the publications of the University should be addressed to

The Secretary of Cornell University,
Ithaca, New York

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1918

CORNELL UNIVERSITY OFFICIAL PUBLICATION

VOLUME IX NUMBER 8

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NEW YORK STATE
COLLEGE OF AGRICULTURE
ANNOUNCEMENT OF THE
SUMMER TERM
1918

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ITHACA, NEW YORK

CALENDAR

Summer Term, 1918

June 3,	Monday,	Registration of all students.
June 4,	Tuesday,	Instruction begins in all courses.
July 4,	Thursday,	Holiday.
Sept. 28,	Saturday,	Instruction ends.

Summer Session

July 8,	Monday,	Summer Session begins.
Aug. 16,	Friday,	Summer Session ends.

Fall Term, 1918–19

Sept. 27,	Friday,	Entrance examinations begin.
Oct. 7–8,	Monday–Tuesday,	Registration of new students.
Oct. 9,	Wednesday,	Registration of old students.
Oct. 10,	Thursday,	Instruction begins.
Oct. 12,	Saturday,	Registration, Graduate School.

NEW YORK STATE COLLEGE OF AGRICULTURE

STAFF OF INSTRUCTION AND EXTENSION WORK

Jacob Gould Schurman, A.M., D.Sc., LL.D., President of the University.
Albert Russell Mann, B.S.A., A.M., Dean of the College of Agriculture, Director of the Experiment Station, and Director of Extension.
Isaac Phillips Roberts, M.Agr., Professor of Agriculture, Emeritus.
John Henry Comstock, B.S., Professor of Entomology and General Invertebrate Zoology, Emeritus.
Henry Hiram Wing, M.S. in Agr., Professor of Animal Husbandry.
Thomas Lyttleton Lyon, Ph.D., Professor of Soil Technology.
John Lemuel Stone, B.Agr., Professor of Farm Practice.
James Edward Rice, B.S.A., Professor of Poultry Husbandry.
George Walter Cavanaugh, B.S., Professor of Chemistry in its Relations to Agriculture.
George Nieman Lauman, B.S.A., Professor of Rural Economy.
Herbert Hice Whetzel, M.A., Professor of Plant Pathology.
Elmer Otterbein Fippin, B.S.A., Extension Professor of Soil Technology.
George Frederick Warren, Ph.D., Professor of Farm Management.
William Alonzo Stocking, M.S.A., Professor of Dairy Industry.
Wilford Murry Wilson, M.D., Professor of Meteorology.
Ralph Sheldon Hosmer, B.A.S., M.F., Professor of Forestry.
James George Needham, Ph.D., Professor of Entomology and Limnology.
Rollins Adams Anderson, D.Sc., Professor of Plant Breeding.
Harry Houser Love, Ph.D., Professor of Plant Breeding Investigations.
Donald Reddick, Ph.D., Professor of Plant Pathology.
Edward Gerrard Montgomery, M.A., Professor of Farm Crops.
George Alan Works, B.Ph., M.S. in Agr., Professor of Rural Education.
Flora Rose, B.S., M.A., Professor of Home Economics.
Martha Van Rensselaer, A.B., Professor of Home Economics.
William Albert Riley, Ph.D., Professor of Insect Morphology and Parasitology.
James Adrian Bizzell, Ph.D., Professor of Soil Technology.
Glenn Washington Herrick, B.S.A., Professor of Economic Entomology and Entomologist of the Experiment Station.
Howard Wait Riley, M.E., Professor of Rural Engineering.
Harold Ellis Ross, M.S.A., Professor of Dairy Industry.
Hugh Charles Troy, B.S.A., Professor of Dairy Industry.
Samuel Newton Spring, B.A., M.F., Professor of Silviculture.
Karl McKay Wiegand, B.S., Ph.D., Professor of Botany.
William Henry Chandler, M.S. in Agr., Professor of Pomology.
Arthur Bernhard Recknagel, B.A., M.F., Professor of Forest Management and Utilization.
Merritt Wesley Harper, M.S., Professor of Animal Husbandry.
Cyrus Richard Crosby, A.B., Extension Professor of Entomology.
Elmer Seth Savage, M.S.A., Ph.D., Professor of Animal Husbandry.
Kenneth Carter Livermore, M.S. in Agr., Professor of Farm Management.
Edward Albert White, B.Sc., Professor of Floriculture.
Alvin Casey Beal, Ph.D., Professor of Floriculture.
Herbert Andrew Hopper, B.S.A., M.S., Extension Professor of Animal Husbandry.
Edward Sewall Guthrie, M.S. in Agr., Ph.D., Professor of Dairy Industry.
Maurice Chase Burritt, M.S. in Agr., Professor and Vice Director of Extension.
William Charles Baker, B.S.A., Professor of Drawing.
Mortier Franklin Barrus, Ph.D., Extension Professor of Plant Pathology.
Lewis Josephus Cross, B.A., Ph.D., Professor of Chemistry in its Relations to Agriculture.
Oskar Augustus Johannsen, A.M., Ph.D., Professor of General Biology.
Clyde Hadley Myers, Ph.D., Professor of Plant Breeding.

Bristow Adams, B.A., Professor, Editor and Chief of Publications.
Dick J. Crosby, M.S., Professor in Extension Service.
Asa Carlton King, B.S.A., Professor of Farm Practice.
Cornelius Betten, Ph.D., Professor, Secretary, and Registrar.
George Abram Everett, A.B., LL.B., Professor of Extension Teaching.
Frederick Llewellyn Griffin, B.S., M.S., Extension Professor of Rural Education.
Lewis Knudson, B.S.A., Ph.D., Professor of Botany.
E. Gorton Davis, B.S., Professor of Landscape Art.
Ralph Wright Curtis, M.S.A., Professor of Landscape Art.
Claude Burton Hutchison, M.S. in Agr., Professor of Plant Breeding.
Ralph Waldo Rees, A.B., B.S., Extension Professor of Pomology.
Jacob Richard Schramm, A.B., Ph.D., Professor of Botany.
Harry Oliver Buckman, M.S.A., Ph.D., Professor of Soil Technology.
Ralph Hicks Wheeler, B.S., Professor in Extension Service.
William Foster Lusk, B.Ph., M.S.A., Professor of Rural Education.
James Ernest Boyle, Ph.D., Extension Professor of Rural Economy.
Paul Work, A.B., M.S. in Agr., Acting Professor of Vegetable Gardening.
Rolland Maclaren Stewart, A.B., Ph.D., Acting Professor of Rural Education.
James Chester Bradley, Ph.D., Assistant Professor of Systematic Entomology.
John Bentley, jr., B.S., M.F., Assistant Professor of Forest Engineering.
George Charles Embody, Ph.D., Assistant Professor of Aquiculture.
Mrs. Helen Binkerd Young, B.Arch., Assistant Professor of Home Economics.
Mrs. Anna Botsford Comstock, B.S., Assistant Professor of Nature Study.
Harry Morton Fitzpatrick, Ph.D., Assistant Professor of Plant Pathology.
Byron Burnett Robb, B.S. in Agr., M.S. in Agr., Assistant Professor of Rural Engineering.
Walter Warner Fisk, M.S. in Agr., Assistant Professor of Dairy Industry.
Vern Bonham Stewart, Ph.D., Assistant Professor of Plant Pathology.
Annette J. Warner, Assistant Professor of Home Economics.
Royal Gilkey, B.S.A., Assistant Professor in Extension Service, and Supervisor of Reading Course for the Farm.
Charles Truman Gregory, Ph.D., Assistant Professor of Plant Pathology.
Lex Ray Hesler, Ph.D., Assistant Professor of Plant Pathology.
William Howard Rankin, Ph.D., Assistant Professor of Plant Pathology.
Earl Whitney Benjamin, B.S. in Agr., M.S. in Agr., Ph.D., Assistant Professor of Poultry Husbandry.
Arthur Johnson Eames, A.B., A.M., Ph.D., Assistant Professor of Botany.
James Kenneth Wilson, B.S., Ph.D., Assistant Professor of Soil Technology.
Elmer Eugene Barker, Ph.D., Assistant Professor of Plant Breeding.
Edward Mowbray Tuttle, B.S. in Agr., A.B., Assistant Extension Professor of Rural Education.
Robert Matheson, M.S. in Agr., Ph.D., Assistant Professor of Economic Entomology and Assistant Entomologist of the Experiment Station.
Blanche Evans Hazard, A.B., M.A., Assistant Professor of Home Economics.
David Lumsden, Assistant Professor of Floriculture.
John Hall Barron, B.S.A., Assistant Extension Professor of Farm Crops.
Gad Parker Scoville, B.S. in Agr., Assistant Extension Professor of Farm Management.
Arthur Augustus Allen, Ph.D., Assistant Professor of Ornithology.
Leonard Amby Maynard, A.B., Ph.D., Assistant Professor of Animal Husbandry.
Forest Milo Blodgett, Ph.D., Assistant Extension Professor of Plant Pathology.
Howard Edward Babcock, Ph.B., Assistant Professor, and State Leader of County Agents.
Edward Riley King, B.S., Assistant Professor of Entomology.
Frank Elmore Rice, A.B., Ph.D., Assistant Professor of Chemistry in its Relations to Agriculture.
Lester Whyland Sharp, B.S., Ph.D., Assistant Professor of Botany.
John Clarence McCurdy, B.S., C.E., Assistant Professor of Rural Engineering.
Clarence A. Boutelle, Assistant Professor of Animal Husbandry.

Charles Howard Royce, M.S.A., Assistant Extension Professor of Animal Husbandry.
George Harris Collingwood, B.S., A.M., Assistant Extension Professor of Forestry.
Montgomery Robinson, Litt.B., Assistant Professor in Extension Service.
Wesley Worth Warsaw, B.S. in A.E., Assistant Extension Professor of Soil Technology.
Otis Freeman Curtis, A.B., Ph.D., Assistant Professor of Botany.
Thomas Joseph McInerney, M.S. in Agr., Assistant Professor of Dairy Industry.
Eugene Davis Montillon, B.Arch., Assistant Professor of Landscape Art.
Juan Estevan Reyna, E.E., Assistant Professor of Drawing.
Leslie Eugene Hazen, B.S. in Agr., M.E., Assistant Professor of Farm Mechanics.
Earl Long Overholser, B.S.A., M.A., Assistant Professor of Pomology.
Arthur John Heinicke, B.S.A., M.A., Ph.D., Assistant Professor of Pomology.
Olney Brown Kent, B.S., Ph.D., Assistant Professor of Poultry Husbandry.
Henry William Schneck, B.S., M.S.A., Assistant Professor of Vegetable Gardening.
Karl John Seulke, M.S.A., Ph.D., Assistant Professor of Animal Husbandry.
Louis Melville Massey, A.B., Ph.D., Assistant Professor of Plant Pathology.
Ellis Lore Kirkpatrick, B.S.A., Assistant Professor of Vegetable Gardening.
Beulah Blackmore, B.S., Assistant Professor of Home Economics.
Paul J. Kruse, A.B., Ph.D., Assistant Professor of Rural Education.
Bernard Albert Chandler, B.S., M.F., Assistant Professor of Forest Utilization.
Ivan Claude Jagger, B.S., Assistant Professor of Plant Pathology.
Warren Kendall Blodgett, 2d, A.B., Assistant Extension Professor of Farm Mechanics.
Katharine Glover, Assistant Professor of Home Economics.
Dyer Barker Lake, B.S., M.S., Ph.D., Acting Assistant Professor of Animal Husbandry.
George Walter Tailby, jr., B.S.A., Instructor, and Stockman in Animal Husbandry.
Earle Volcart Hardenburg, B.S., M.S. in Agr., Instructor in Farm Crops.
Richard Alan Mordoff, B.S. in Agr., Instructor in Meteorology.
Oliver Wesley Dynes, B.S., M.S. in Agr., Instructor in Farm Crops.
James Lewis Strahan, B.S. in Agr., M.S. in Agr., Instructor in Farm Structures.
Cass Ward Whitney, B.S., Instructor in Extension Service.
Allan Cameron Fraser, B.S., Instructor in Plant Breeding.
Lua Alice Minns, B.S., Instructor in Floriculture.
George Cornell Supplee, M.S.A., Instructor in Dairy Industry.
Anna Elizabeth Hunn, B.S., Instructor in Home Economics.
William Thomas Craig, Instructor in Plant Breeding.
DeVoe Meade, B.S., Instructor in Animal Husbandry.
Edward Gardner Misner, B.S., Instructor in Farm Management.
Winfred Enos Ayres, Extension Instructor in Dairy Industry.
Clark Leonard Thayer, B.Sc., Instructor in Floriculture.
Ralph Sylvanus Moseley, Extension Instructor in Poultry Husbandry.
Lewis Merwin Hurd, Extension Instructor in Poultry Husbandry.
William Irving Myers, B.S., Instructor in Farm Management.
Albert Reiff Bechtel, B.S., A.M., Instructor in Botany.
James Marshall Brannon, B.A., M.A., Instructor in Botany.
Frank Burkett Wann, A.B., Instructor in Botany.
Wallace Larkin Chandler, B.S., M.S., Ph.D., Instructor in Parasitology.
Mary Frances Henry, A.B., Instructor in Home Economics.
Clara Louise Garrett, B.S., Instructor in Drawing.
Clarence Vernon Noble, B.S., Instructor in Farm Management.
Sarah Lucile Brewer, B.S., Instructor in Home Economics.
Charles Parsons Clark, B.S., Extension Instructor in Farm Management.
Anna Jane Hancy, A.B., A.M., Instructor in Botany.
Louis Arthur Zimm, B.S., Instructor in Plant Pathology.
Walter Gernet Krum, Instructor in Poultry Husbandry.
Howard Campbell Jackson, B.S., Instructor in Dairy Industry.
Julia Gleason, Instructor in Home Economics.
Claribel Nye, B.S., Extension Instructor in Home Economics.

Winifred Moses, B.S., Instructor in Home Economics.
Helen Canon, B.A., B.S., Extension Instructor in Home Economics.
Gustave Frederick Heuser, B.S., M.S. in Agr., Instructor in Poultry Husbandry.
Clarence Hamilton Kennedy, A.B., M.A., Instructor in Limnology.
Edwina Maria Smiley, A.B., Instructor in Plant Pathology.
Edward Henry Dusham, A.B., M.S., Instructor in Biology.
Mrs. Edith Fleming Bradford, B.S., Instructor in Home Economics.
Sara Buchanan Huff, Instructor in Home Economics.
George Clayton Dutton, Extension Instructor in Dairy Industry.
Benjamin Percy Young, B.S., Instructor in Entomology.
Peter Walter Claassen, M.A., Instructor in Natural History.
Roy Glen Wiggans, B.S.A., M.S.A., Instructor in Farm Crops.
Marshall Evarts Farnham, B.S., Instructor in Floriculture.
Frank Pores Bussell, B.A., Extension Instructor in Plant Breeding.
Roy Lewis Gillett, B.S., Instructor in Farm Management.
Mrs. Jessie Austin Boys, B.S., Instructor in Home Economics.
Laurence Joseph Norton, B.S., Instructor in Farm Management.
Charles Chupp, A.B., Ph.D., Instructor in Plant Pathology.
William Alonzo Whiting, B.S., Instructor in Dairy Industry.
Benjamin Dunbar Wilson, M.S., Instructor in Soil Technology.
Gertrude Elizabeth Douglas, A.B., A.M., Ph.D., Instructor in Botany.
Hazel Buell Bennett, B.S., Instructor in Rural Education.
John Phineus Benson, B.S., Instructor in Botany.
Ralph Simpson Nanz, B.S., Instructor in Botany.
Walter Conrad Muenscher, A.B., M.A., Instructor in Botany.
Harry Earl Bremer, B.S., Instructor in Dairy Industry.
Gladys Elizabeth Smith, B.S., Instructor in Home Economics.
Lawrence Erickson, A.B., Instructor in Botany.
Paul Berwig Schumm, M.L.D., Instructor in Landscape Art.
Frances Remington Kelley, B.A., Instructor in Home Economics.
Nancy Hill McNeal, Ph.B., Extension Instructor in Home Economics.
Walter Sprague Frost, B.S., Instructor in Agricultural Chemical Analysis.
Victor Ferdinand Tapke, B.S., Instructor in Plant Pathology.
Olin Clifford Krum, B.S., Instructor in Poultry Husbandry.
William J. Baerg, M.S., Instructor in Entomology.
Joseph Pullman Porter, B.S., Instructor in Landscape Art.
Lawrence Paul Wehrle, B.S., M.S., Extension Instructor in Entomology.
Robert Bier, B.S., Extension Instructor in Vegetable Gardening.
Ernest Charles Young, B.S., Instructor in Farm Management.
Alice May Blinn, B.S., Extension Instructor in Home Economics.
Ann Palmer Fisher, B.A., M.A., Instructor in Home Economics.
Rodney Wesson Pease, Instructor in Extension Service.
John Hallock Bromley, B.S., Instructor in Soil Technology.
Roy A. Olney, B.S., Critic Teacher of Agriculture.
Ada Eljiva Georgia, Assistant in Natural History.
Emmons William Leland, B.S.A., Superintendent of Field Experiments in Soil Technology.
Ward Benjamin White, A.B., Assistant in Dairy Industry.
Charles Edward Hunn, Assistant in Plant Propagation.
Mary Ellen Hill, B.S., Assistant in Biology.
Ralph Waldo Emerson Cowan, B.S., Assistant in Dairy Industry.
Ernest Gustaf Anderson, B.Sc., Assistant in Plant Breeding.
Charles Loring Allen, B.A., Assistant in Animal Husbandry.
Chester Columbus Demaree, A.B., Assistant in Botany.
Vernon Raymond Haber, B.S., M.A., Assistant in Biology.
Laura Florence, B.Sc., M.A., Assistant in Entomology.
Benjamin Harrison Smith, A.B., Assistant in Plant Pathology.
Walter Housley Wellhouse, M.A., Assistant in Entomology.
Carl Petty Blackwell, B.S., M.S., Assistant in Farm Crops.

Raymond Stratton Smith, B.S., B.S. in Agr., M.S., Assistant in Soil Technology.
Ralph James Morgan, B.S., Assistant in Soil Technology.
Thomas Lysons Martin, B.A., Assistant in Soil Technology.
Eleanor Hillhouse, B.S., Assistant in Home Economics.
Ivan Wright, A.B., M.S., Assistant in Rural Economy.
Mrs. Alice Van Scoy Crandall, B.S., Assistant in Home Economics.
Gordon Kennedy Middleton, B.S., Assistant in Farm Crops.
Ward Charles Jensen, B.S., Assistant in Farm Crops.
Hugh Irwin Macomber, B.S. in Agr., Assistant in Poultry Husbandry.
Frank Latta Fairbanks, M.E., Assistant in Farm Mechanics.
Helen Seaman, A.B., Assistant in Botany.
Freeman Weiss, B.S., Assistant in Botany.
Forrest Clifton Button, B.S., Assistant in Dairy Industry.
George Haines, B.S., Assistant in Animal Husbandry.
Helen Elizabeth Murphy, B.S., Assistant in Biology.
Ruth Isidor Metzger, A.B., Assistant in Pomology.
Mrs. Rita Hope Ballard Eames, B.A., Assistant in Botany.
Marshall Hertig, Assistant in Entomology.
Eugene Curtis Auchter, B.S. in Agr., Assistant in Pomology.
William Trowbridge Merrifield Forbes, Ph.D., Assistant in Entomology.
William Pringle Alexander, Assistant in Entomology.
Alice L. Peck, Assistant in Junior Extension.
Louis Michael Roehl, Supervisor of Farm Shop Work.
Clara Frances Sykes, A.B., B.S., Secretary of the Department of Home Economics.
Olin Whitney Smith, B.S., Assistant Registrar.
Willard Waldo Ellis, A.B., LL.B., Librarian.
George W. Parker, Executive Assistant.

THE NEW YORK STATE COLLEGE OF AGRICULTURE

SUMMER TERM

The college year in Cornell University is divided into two terms, or semesters, extending from the last of September to the early part of June. In the College of Agriculture there is, in addition, a third, or summer term, coordinate with the present fall and spring terms.

The primary purpose of the summer term is to take advantage of the growing season in teaching certain subjects to students regularly registered in either graduate or undergraduate courses. The facilities of the College are available for graduate study throughout the summer. In addition, opportunity is provided for advanced students, teachers, and others, who are otherwise engaged during the regular school year, to have the advantage of a long period of special instruction. Particular attention is given to the needs of assistants and instructors in colleges of agriculture who desire to spend their summers in advanced study.

Registration for the summer term will take place on June 3, 9 a. m. to 4 p. m. All students are expected to register first at the office of the University Registrar in Morrill Hall. They will then present themselves at the office of the Secretary of the College of Agriculture in Roberts Hall for further registration and arrangement of schedules. Instruction will begin at 8 a. m. on June 4. The summer term will close at 5 p. m. on September 18. No classes will be held on July 4.

The requirements for admission to the summer term are stated on page 12.

THE COLLEGE OF AGRICULTURE

Cornell University is composed of eight colleges and the Graduate School. One of these colleges is the College of Agriculture.

Cornell University was chartered by the Legislature in 1865, being founded on the Land Grant Act of 1862. By the terms of the Land Grant Act, teaching in agriculture has been from the first a regular part of the University enterprise. In other states the state government has made appropriations to supplement the work in agriculture. In 1904 the Legislature of the State of New York made an appropriation of $250,000 for the erection of buildings for the College of Agriculture at Cornell University, and established the College as a state institution under the title "The New York State College of Agriculture at Cornell University." Before this time the State had established at Cornell University "The New York State Veterinary College." In 1906 the Legislature passed an Administration Act defining the purpose and activities of the College of Agriculture thus: "The object of the said college of agriculture shall be to improve the agricultural methods of the state; to develop the agricultural resources of the state in the production of crops of all kinds, in the rearing and breeding of livestock, in the manufacture of dairy and other products, in determining better methods of handling and marketing such products, and in other ways; and to increase intelligence and elevate the standards of living in the rural districts. For the attainment of these objects the college is authorized to give instruction in the sciences, arts, and practices relating thereto, in such cases and in such manner as shall best serve the interests of the state; to conduct extension work in disseminating agricultural knowledge throughout the state by means of experiments and demonstrations on farms and gardens, investigations of the economic and social status of agriculture, lectures, publications of bulletins and reports, and in such other ways as may be deemed advisable in the furtherance of the aforesaid objects; to make researches in the physical, chemical, biological, and other problems of agriculture, the application of such investigations to the agriculture of New York, and the publication of the results thereof."

THE BUILDINGS AND FARMS

The buildings. The buildings erected under the enactment of 1904 were first occupied in June, 1907. The central group then erected consisted of a main administration and classroom building, an agronomy building, and a dairy building, the three being connected by covered loggias. Subsequently the Legislature provided for the erection of two large barns, a greenhouse, a home economics building, a forestry building, a poultry husbandry building, a soils building, an auditorium, and a classroom building and stock judging pavilion for animal husbandry. An extension to the greenhouse range, several small poultry buildings, a sheep barn, a swine barn, a farm shop and tool shed, and an addition to the cafeteria in the Home Economics Building have been completed, and a heating plant has been installed.

Other buildings included in the present equipment are a frame building that temporarily houses the Department of Rural Engineering, an insectary, a biological station in the marsh at the south end of Cayuga Lake, a fish breeding house in Cascadilla Creek, a seed storage house, and other small buildings on the farms.

The farms. The College of Agriculture has 933 acres of land, and it rents 195 acres additional, making a total of 1128 acres under college management. These farms are not run for commercial but for educational purposes, and the practices are therefore modified to meet the varied demands of the institution.

Land in the vicinity of the College is very broken, abounding in hills and dales, brooks and gorges. In consequence, less than one-half of the total area is now available for tillage. Of the 1128 acres, 591 are classified as arable, 304 as pasture, and 143 as wood and waste; 51 are devoted to college grounds, buildings, and old orchards, and 39 are retained for other uses.

Of the tillable area, 45 acres have been laid out in permanent experiment plots for the use of the Departments of Soil Technology and Plant Breeding; 50 acres have been assigned to the Department of Pomology and are largely planted to young trees; 29 acres have been assigned to the Department of Floriculture; 24 acres to the Department of Vegetable Gardening; 73 acres to the Department of Poultry Husbandry; 15 acres to farm-crop gardens and experiments; and there are left to the Department of Farm Practice 355 acres on which to conduct the regular farm operations.

The soil of the college farms is heavy, nearly all of it being Dunkirk clay loam. A few fields at the extreme southeastern corner are Volusia stony loam. The Dunkirk clay loam is entirely unsuited to potatoes and is not well adapted to corn, but will grow fair crops of corn if heavily manured. It is well adapted to wheat, oats, timothy, and clover. The Volusia stony loam when well drained and freed from stones is well adapted to corn and potatoes. The recently acquired areas lack both these improvements.

EXPENSES

Tuition in the College of Agriculture is free to graduate students and to undergraduate students who for a year or more immediately preceding matriculation have been residents of the State of New York. The annual tuition fee for students from outside the State is $150 for two terms. The tuition fee for the summer term is $75.

Other fees, required of all students, are as follows:

Matriculation fee	$ 5.00
Fee for baccalaureate degree	10.00

Deposit fees are required in various laboratory courses; inquiry concerning these should be made before registration. Students are liable to a special charge for breakage or damage resulting from their own carelessness. Attention is called to the expenses of excursions required in various courses.

The expense of textbooks, instruments, and other necessary articles varies from $10 to $75 a year.

There are many private boarding and rooming houses near the University campus. In these the cost of board and furnished room, with heat and light, varies from $6 to $12 a week. By the formation of clubs, students are sometimes able to reduce their expenses for room and board.

For more detailed information regarding fees, reference should be made to the college announcement for the year or to the General Circular of Information.

GENERAL INFORMATION CONCERNING COURSES

The regular instruction in the College of Agriculture constitutes a course of four years, or eight terms, leading to the degree of Bachelor of Science. There is a combined course with the State Veterinary College leading to two baccalaureate degrees. Summer courses in agriculture, designed especially for teachers, school principals and superintendents, and advanced college students, are offered in the six-weeks Summer Session of the University. Aside from these there are winter courses without University credit, and opportunities for students to pursue special work. Circulars describing the winter courses and the short summer courses may be obtained on application to the Secretary.

Students may pursue agricultural subjects in the Graduate School of the University. For full information concerning graduate work and degrees, see the Announcement of the Graduate School.

THE REGULAR FOUR-YEAR COURSE

Men who are candidates for admission to the regular, or four-year, course must be at least sixteen years of age; women must be at least seventeen years of age. They must have certificates of good moral character, and students from other colleges or universities are required to furnish from those institutions certificates of honorable dismissal. Students are admitted on examination, or on presenting credentials of the Education Department of the State of New York, or on acceptable school certificates.

Prospective students who have neither lived on farms nor had considerable practical experience in agriculture are urged to spend at least one year on a well-managed farm in order to familiarize themselves with common farm affairs and operations before entering the College. This experience is imperative in order to satisfy the farm-practice requirement.

Candidates for admission must file their credentials and obtain permits for examination at the University Registrar's office, Morrill 10. The results of examination may be ascertained from the Registrar.

ENTRANCE REQUIREMENTS FOR THE FOUR-YEAR COURSE

The subjects that may be offered for admission are named in the following list; the figures in parenthesis following each subject indicates its value in units and shows the maximum and the minimum amount of credit allowed in the subject. A unit represents five recitations a week for one year in a study.

1a.	English No. 1	(1½)
1b.	English No. 2	(1½)
2a.	First Year Greek	(1)
2b.	Second Year Greek	(1)
2c.	Third Year Greek	(1)
3a.	First Year Latin	(1)
3b.	Second Year Latin	(1)
3c.	Third Year Latin	(1)
3d.	Fourth Year Latin	(1)
4a.	First Year German	(1)
4b.	Second Year German	(1)
4c.	Third Year German	(1)
5a.	First Year French	(1)
5b.	Second Year French	(1)
5c.	Third Year French	(1)
6a.	First Year Spanish	(1)
6b.	Second Year Spanish	(1)
6c.	Third Year Spanish	(1)
7a.	First Year Italian	(1)
7b.	Second Year Italian	(1)
7c.	Third Year Italian	(1)
8a.	Ancient History	(½–1)
8b.	Modern and Medieval History	(½–1)
8c.	American History, Civics	(½–1)
8d.	English History	(½–1)
9a.	Elementary Algebra	(1)
9b.	Intermediate Algebra	(½)
9c.	Advanced Algebra	(½)
9d	Plane Geometry	(1)
9e.	Solid Geometry	(½)
9f.	Plane Trigonometry	(½)
9g.	Spherical Trigonometry	(½)
10.	Physics	(1)
11.	Chemistry	(1)
12.	Physical Geography	(½–1)
13.	Biology*	(1)
14.	Botany*	(½–1)
14a.	Zoology*	(½–1)
15.	Bookkeeping**	(½–1)
16.	Agriculture (including home economics)**	(½–4)
17.	Drawing	(½–1)
18.	Manual Training	(1)
19.	Any high school subject or subjects not already used	(½–1)

For admission to the New York State College of Agriculture, an applicant must offer either A or B as below:

A. Fifteen units arranged as follows: English (3), history (1), elementary algebra (1), plane geometry (1), a foreign language† (3), elective (6). Solid geometry and plane trigonometry are recommended among the elective units for students entering the courses of forestry or landscape art.

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*If an applicant has counted Biology (1), he may not also offer Botany (½) or Zoology (½).

**An applicant may not offer to exceed four units in vocational subjects under numbers 16, 18, and 19 combined. Bookkeeping may not be offered together with more than one of the subjects listed under 16, 17, and 18.

†French or German is recommended for entrance. For the Graduate School requirement with reference to a reading knowledge of French and German, see page 6 of the Announcement of the Graduate School.

B. The Arts College Entrance Diploma or the Science College Entrance Diploma issued by the Department of Education of the State of New York.

Requirements for Admission of Special Students

Opportunities are provided for persons who desire to pursue special studies. In order to be eligible for admission to special work, applicants must offer two full years of recent farm experience and must also either have fifteen units of entrance credits or be twenty-one years of age. In addition, applicants for admission on the age requirement must satisfy the faculty of their ability to handle the work; and every applicant must satisfy the faculty of his bona fide desire for special study. He will be required to present an honorable dismissal from the school last attended, certificates of good moral character, and such other certificates and letters as may be desired. The special work is designed to meet the needs of young men and young women from farms who have not time for a four-year course, and of mature persons who desire to spend a brief period in specialized study. The work is not a definite "course" in the sense of having a program or a prescribed set of studies. The student chooses any of the agricultural "electives" that he is fitted to pursue. Certain courses are given by some of the departments for students who lack some of the fundamental work usually required in those subjects. Admission as a special student does not admit to classes. The student is admitted to the various classes by the heads of the departments concerned.

Requirements for Admission to the Summer Term

Applicants for admission to the summer term as regular students in the four-year college course must, in addition to satisfying entrance requirements in full, have completed all the required work of the first two years of the regular course as outlined on pages 13–14, or the substantial equivalent thereof. Special students are admitted to the summer term on the same basis as to other terms, as recited above.

Other Details for Admission

For other details as to subjects and methods for admission, see the General Circular of Information, which may be obtained on application to the Secretary, Cornell University, Ithaca, New York.

For admission to advanced standing from other colleges and universities all communications should be addressed to the Registrar of the University. See the General Circular of Information.

For admission as a special student, communications should be addressed to the Secretary, College of Agriculture, and attention is called to the paragraphs on page 30 of the General Circular of Information.

For admission to graduate work and candidacy for advanced degrees, communications should be addressed to the Dean of the Graduate School.

Requirements for the Degree of Bachelor of Science

The requirements for the degree of Bachelor of Science shall be residence for eight terms, and, in addition to the prescribed work in the Department of Physical

Culture and of Military Science and Tactics, the completion of one hundred and twenty hours of required and elective work as outlined on pages 13–14.

All men students must satisfy the farm-practice requirement before the beginning of the senior year. Exemption from this requirement is allowed only to students specializing in the Department of Botany, Home Economics, Forestry, Entomology, or Landscape Art. Application for such exemption must be made at the office of the Secretary. All new students, except women, must report to the Department of Farm Practice as assigned at registration.

A student admitted to the College of Agriculture from another college in Cornell University, or from any other institution of collegiate rank, will be regarded as having completed the number of terms and hours to which his records entitle him, and will receive all the privileges of students who have completed the same number of terms and hours by residence in the College. In order, however, to obtain the degree of Bachelor of Science, he must have completed the prescribed subjects in the four-year course and the requisite number of elective hours in agricultural subjects. He must also have been in residence in the College of Agriculture for at least two consecutive terms and have completed not less than fifteen hours a term, of which two-thirds, at least, must be subjects taught by the staff of the College of Agriculture.

A student must register for at least six hours each term, and no new student may register for more than eighteen hours. Maximum registration by old students is determined on the basis of record.

Regular students may take at their discretion during their four years not to exceed twenty hours of elective subjects in courses offered in other colleges than Agriculture; but such elective subjects shall not interfere with required or back work. Special students must take at least two-thirds of the entire work of each year from subjects taught by members of the staff of Agriculture.

Students admitted before September, 1917, are subject to the requirements for graduation as stated in the regular announcement of 1916–17 and the summer term announcement of 1917.

The Course Leading to the Degree of Bachelor of Science

Freshman year	Number of course	Hours 1st term	Hours 2d term
English	1	3	3
Chemistry	1	6	–
Biology§	1	–	3
Zoology	1	3	3
Botany	1	3	3
The Natural History of the Farm	1	1 or	1
Electives*		0–3	3–6
Total		15–18	15–18

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§May be taken in sophomore year by students who have a major in home economics.

*Professional students in forestry who do not offer solid geometry and plane trigonometry for entrance are required to take these subjects in their freshman year.

Sophomore year	Number of course	Hours 1st term	Hours 2d term
Geology‡	1	3	–
Physics	2	–	5
Physiology, one of the following:			
Physiology of Domestic Animals	10	3	–
Human Physiology	3	–	3
Plant Physiology	20	4 or	4
At least five hours in the following subjects:			
Chemistry	....	....	
Mathematics	....	....	
Bacteriology	....	....	

In addition to the above, the required work in military drill and physical training must be taken.

Political Science 51 may be taken this year.

Junior year	Number of course	Hours 1st term	Hours 2d term
Political Science	51	3	3

Elective Courses

The remainder of the work—sixty-nine or seventy hours—is made up of electives to be taken under the following restrictions:

A student may take at his discretion during his four years not to exceed twenty hours of elective subjects in courses offered in other colleges than Agriculture; but such elective subjects shall not interfere with required or back work. The remainder of his elective work must be offered from the agricultural subjects described on the following pages.

In selecting his course after the first year the student must obtain the advice and approval of a professor or an assistant professor preferably in the department in which he expects to specialize, who shall be chosen by the student at the beginning of the sophomore year. Students expecting to specialize in forestry, landscape art, rural education, or home economics must take as their advisers professors or assistant professors in those departments. All students who are preparing for teaching are recommended to consult the Professor of Rural Education as well as their Faculty Adviser before filing their term schedules.

GRADUATED CREDIT

Beginning with the first term of 1916–17 the passing grades are designated A, B, C, D, and P. Beginning with the class of 1920 students receiving grade C are to receive normal credit toward graduation; grade B, 10 per cent additional credit; grade A, 20 per cent additional credit; grade D, credit reduced 10 per cent; and grade P, credit reduced 20 per cent. No student may be graduated in less than eight terms unless his work in the College of Agriculture averages 15 per cent excess credit.

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‡Optional for students taking a major in home economics.

DEPARTMENTS OF INSTRUCTION

BOTANY

6. **Taxonomy of the Higher Plants.** Credit four hours. Prerequisite course 1 or its equivalent. Lecture by appointment. Roberts Hall 292. Laboratory, T Th, 2–5. Agronomy Building, Botanical Laboratory. Remainder of the work at times optional with the student. Professor WIEGAND and Mr. BECHTEL.

A study of the kinds of seed plants and ferns, their classification into genera families and orders, and field work on the local flora about Ithaca. Emphasis will be placed on wild plants, but the more common cultivated plants will receive some attention. The course is planned to follow course 1 and furnish an introduction to field botany and classification of the higher plants, in preparation for special work in various departments and in teaching. Instruction will be given in the preparation of an herbarium and of keys. Laboratory fee, $3.50; deposit to cover apparatus, $2.

6a. **Advanced Field Course in Taxonomy.** Credit four hours. Prerequisite course 6 or its equivalent. Laboratory and field work, W, 8–1, 2–5. Remainder of work at times optional with the student. Professor WIEGAND and Mr. BECHTEL.

An intensive study of the summer flora about Ithaca, with the consideration also of some advanced problems and methods in taxonomy. Laboratory fee, $3.50; deposit to cover apparatus, $2.

7. **Weeds and Weed Seeds.** Credit two hours. Prerequisite course 1 or its equivalent. Lecture and laboratory by appointment. Agronomy Building, Botanical Laboratory. Mr. BECHTEL.

This course is designed to meet the needs of students of agriculture who wish to obtain a working knowledge of weeds and weed seeds. It will also aid persons intending to teach nature study and agriculture in the schools. Laboratory fee, $1.50.

9. **Histology.** Credit four hours. Prerequisite course 1 or its equivalent. Lecture, F, 8. Laboratory, T Th, 8–10.30, F, 9–11.30. Agronomy Building, Botanical Laboratory. Assistant Professor EAMES.

This course is designed to give a working acquaintance with the internal morphology of vascular plants and with the terminology of cells, tissues, and organs. Emphasis is placed on practice in the interpretation and determination of material. To cover the range of variation in cells and tissues, a large amount of material is studied. Variation in form and structure is considered from the standpoint of phylogenetic development and adaptive modification. The course is of value especially to students of morphology, pathology, and plant physiology. Laboratory fee, $5.

18. **Research in General Botany, Histology, and Taxonomy.** Credit not less than three hours. Professor WIEGAND and Assistant Professor EAMES.

A course designed for graduates and advanced students. Original investigation by students who are adequately prepared. The laboratory fee depends on the nature of the work.

19. **Seminary in Taxonomy, Morphology, Cytology, and Histology.** Required of graduate students in the Department. Hours and place to be arranged. Professor WIEGAND and Assistant Professor EAMES.

Broad problems pertaining to botany will be discussed; literature will be reviewed; reports of research will be given.

20. **Plant Physiology.** Credit four hours. Prerequisite all freshman work or its equivalent including course 1. One lecture, one recitation, and five hours in laboratory. Time and place to be arranged. Mr. BENSON.

This course may be taken to satisfy the requirement in physiology. It is a general course in the physiology of plants. Particular emphasis is placed in both laboratory and recitation, on individual discussions of the principles taught and their applications. Laboratory fee, $4; breakage fee, $2.

21a. **Plant Physiology, Advanced Lecture Course.** Credit four hours. Prerequisite training in botany and chemistry, to be determined in each case by the instructor. Hours to be arranged. Agronomy Building 192. Assistant Professor CURTIS.

21b. **Plant Physiology, Advanced Laboratory Course.** Credit six hours. Prerequisite, as for course 21a. Laboratory, M T Th F, 10–1. Agronomy Building 21. Assistant Professor CURTIS and Mr. BENSON.

Topics include nutrition, osmotic pressure, permeability, absorption, conduction, transpiration, photosynthesis, metabolic products, digestion, translocation, respiration, fermentation, growth, stimulation, toxicity, reproduction, and plant response. Lectures and laboratory work are supplemented by written reports. Laboratory fee, $10; breakage deposit, $5.

Courses 21a and 21b are the equivalent of course 21, the credit for which is five hours a term in the first and second terms. These courses are designed primarily for advanced or graduate students, and particularly for those specializing in plant study. Students may take both 21a and 21b in the third term, or either may be taken alone.

[30. **Special Chapters in Metabolism.** Credit one hour. Open to graduates or to undergraduates who have had course 21 and organic chemistry. Lecture, F, 9. Agronomy Building 192. Professor KNUDSON.] Not given in 1918.

A study of some of the more important temporary and storage products of plant metabolism.

31. **Seminary in Plant Physiology.** Required of graduate students in plant physiology. Conference, hours to be arranged. Agronomy Building 192. Assistant Professor CURTIS.

Topics will be chosen from current work in plant physiology.

33. **Research, Plant Physiology.** Credit for major or minor, otherwise not less than four hours. Prerequisite training in botany, chemistry, and physiology. Agronomy Building 101. Assistant Professor CURTIS.

Problems in plant physiology and in the general relation of plant physiology to agriculture will be assigned for investigation. Reports or a thesis will be required. The amount of the laboratory fee is governed by the nature of the work.

DRAWING

2a. **Free-hand Drawing and Outdoor Sketching.** Credit from two to five hours. Prerequisite course 2 or its equivalent. Students must register for not less than two hours. Lectures during practice. Practice by appointment, T W Th F, 8–1, T W Th, 2–5. Dairy Building 371. Professor BAKER.

While this course is intended primarily for students in landscape art—being out-of-door study, in pencil, pen and ink, and water color, of foliage, tree growth, and architecture—provision is also made for the general student and for teachers of drawing in the secondary schools.

ENTOMOLOGY, LIMNOLOGY, AND NATURE-STUDY

2. **The Ecology of Insects.** Credit three hours. Lecture, W, 8. Roberts Hall 392. Practical exercises (largely field work), W, 10–12.30, and another period of two and a half hours by appointment. Professor NEEDHAM and Mr. LLOYD.

A general course in the study of the lives of insects in relation to their environment. Practical studies will be made of the activities of insects and of the rôle that they play in different natural associations. Observations will be made on the relations between their structures and instincts and the situations in which they live, and on many of the ways in which they find a living and establish homes. Laboratory fee, $2.50.

3. **General Entomology.** Credit three hours. Prerequisite course 1 or Zoology 1. Lectures, M W, 9. Practical exercises, W Th, 2–4.30. Roberts Hall 392. Assistant Professor MATHESON and Mr. ———.

Lectures on the characteristics of orders, suborders, and the more important families, and on the habits of representative species. The practical exercises include a study of the structure of insects and practice in their classification. The lectures only (credit two hours) are taken by those who have had courses 4 and 5. When possible the laboratory work will utilize materials collected by the student in the field. Laboratory fee, $1.50.

4. **Elementary Morphology of Insects.** Credit three hours. By appointment. Roberts Hall 391. Mr. YOUNG.

An introductory laboratory course. See note under course 5. Laboratory fee, $2.

5. **Elementary Systematic Entomology.** Credit two hours. Prerequisite course 4. Hours by appointment. Roberts Hall 391. Mr. YOUNG.

Laboratory fee, $2.

Courses 4 and 5 are introductory laboratory courses, required of all students who plan to take advanced work in entomology. The work is individual, and both courses may be taken in one term.

10. **Entomotaxy.** Credit two or three hours. Prerequisite course 4, should be accompanied by course 5. Laboratory and field work, W F, 2–5, and for three-hour students, Th or F, 10–1. Roberts Hall 301. Assistant Professor BRADLEY.

Methods of collecting insects and of preserving them for study and for the cabinet, together with other matters of technique. Practice in the identification of the insects of the local fauna. Two all-day field trips will be required.

19. **Research in Systematic Entomology.** Credit three or more hours. Prerequisite courses 3, 10, 11, 14, 20, and one term of course 12. Laboratory hours by arrangement. Roberts Hall 301. Assistant Professor Bradley, Professors Needham and Johannsen.

29. **Research in Morphology of Insects.** Credit three or more hours. Prerequisite courses 3, 4, and 5. Laboratory open daily except S, 8–5; S, 8–1. Roberts Hall 391. Professor Needham.

Special work arranged with reference to the needs and attainments of each student. Laboratory fee, $1.50 a credit hour.

40. **Advanced Economic Entomology and Insectary Methods.** Credit three hours. Open only to graduates. Seminary, T, 2–4.30. Field and laboratory work by appointment. Insectary. Assistant Professor Matheson.

Economic problems connected with applied entomology will be discussed and reported on, and field observations will be made. Experimental methods in breeding, photographing, investigating, and controlling insects will be discussed and studied. Designed for advanced students in entomology who desire to fit themselves for experiment station work. Laboratory fee, $2.50.

49. **Research in Economic Entomology.** Credit three or more hours. Prerequisite courses 3, 4, 5, 11, and 14. Laboratory and field work by appointment. Insectary. Professor Herrick and Assistant Professor Matheson.

In most cases it is impracticable to complete an investigation in this subject during the college year. Students must arrange to conduct their observations during the growing season.

50. **General Limnology.** Credit three hours. Open only to students who have taken or are taking course 3 and Biology 1, or the equivalent. Lecture, Th, 8. Roberts Hall 392. Laboratory, Th, 2–4.30, and another period of two and a half hours by appointment. Roberts Hall 492. Professor Needham and Mr. Lloyd.

An introduction to the study of the life of inland waters. Aquatic organisms in their qualitative, quantitative, seasonal, and ecological relations. Laboratory fee, $2.50.

59. **Research in Limnology.** Credit three or more hours. Prerequisite course 50 or its equivalent. Laboratory and field work by appointment. Roberts Hall 492 and Biological Field Station. Professors Needham and Johannsen, and Assistant Professor Embody.

61. **Nature Study.** Third term, credit three hours. Lecture and field work to be arranged. Laboratory, W, 2.30–5. Insectary. Assistant Professor Comstock and———.

This course gives laboratory and field practice with those subjects in plant and animal life that are best fitted for nature study in the elementary schools. Special attention is given to methods of study and manner of presentation, and also to the relation of the topics to agriculture. The work consists of conferences, field practice, and laboratory practice. The lectures discuss nature study as a part of elementary education, and methods of correlating nature study with other school work.

Seminary. M, 4.30–5.30. Roberts Hall 392.

The work of an entomological seminary is conducted by the Jugatæ, an entomological club which meets for the discussion of the results of investigations.

FARM CROPS

These courses to be given in the summer of 1918 on the condition that five or more advanced students register for them.

2. **Farm Crops, Advanced Course.** Credit three hours. Prerequisite course 1. Lectures, M T W, 11. Poultry Building 175. Professor MONTGOMERY.

The object of this course is to study the more important principles of crop production, based on experimental evidence. Both cereal and forage crops are studied. An effort is made to acquaint the student with the best sources of literature, especially the work of experiment stations. About six hours of reference reading is required each week.

5. **Seminary.** Without credit. Required of graduate students. M, 4. Poultry Building. Professor MONTGOMERY.

6. **Research.** Credit two or more hours. Prerequisite permission to register. Limited to graduate students. Professor MONTGOMERY.

FARM PRACTICE

1. **Farm Practice.** Without credit. Hour and place by appointment. Professor KING and Mr. ———.

An elective course designed to assist students in meeting the requirements in farm practice demanded by the College. In order to meet these requirements, students must have a practical knowledge of horses, cattle, sheep, swine, poultry, crops, farm machinery, orcharding, gardening, butter and cheese making, and the like. All men students except those whose record and registration at the beginning of the senior year show that they are specializing to the extent of fifteen hours in home economics, forestry, landscape art, or entomology, must fully satisfy, before the beginning of the senior year, the requirements in farm practice. The Department of Forestry requires three months of forestry practice in lieu of the farm practice requirement. All men students are required to report to the Department of Farm Practice as assigned within the first three weeks of their first term in the College.

FLORICULTURE

3. **Commercial Floriculture.** Credit four hours. Prerequisite course 1 or commercial experience, and course 2. Lectures and recitations, M W F, 9. Practice, W, 2–4.30. Greenhouses. Assistant Professor LUMSDEN.

Studies in the propagation and culture of florists' crops. As far as possible practical work will be given in the propagation and culture of roses, carnations, violets, orchids, and other plants grown for commercial purposes. Methods of packing and shipping, and marketing will be considered. Laboratory fee, $2.

8. **Garden Flowers.** Credit three hours. Lectures, T Th, 9. Practice, T or Th, 2–4.30. Greenhouses and gardens. Assistant Professor LUMSDEN.

A study is made of the identification, propagation, and culture of annuals, herbaceous perennials, and roses in order to give the student an intimate knowledge of the forms that may be used in garden planting either on home grounds or in public parks. An excellent collection of plant material is available for demonstration work in this course. All members of this class will be required to participate in an excursion to the Thompson estate at Canandaigua on August 15. Laboratory fee, $2.

8a. **Grouping and Arrangement of Annuals and Herbaceous Perennials.** Credit two hours. Prerequisite course 8 and Botany 1. Lecture, S, 9. Practice, S, 10–12.30. Greenhouses. Assistant Professor Lumsden.

A study of the principles and methods of arrangement of garden flowers in the border and the flower garden. The planting of borders for a continuous display of bloom throughout the season. Æsthetic taste in color arrangement will also be studied. Laboratory fee, $2.

9. **Amateur Floriculture.** Credit three hours. Lectures, W F, 9. Practice, M, 2–4.30. Greenhouses. Mr. Thayer.

The propagation and culture of potted plants in the home—plants suitable for window gardening and for outdoor home gardening. The course includes a study of containers, soils, fertilizers, and insecticides; also the preparation and planting of flower beds. It is planned primarily for students who are interested especially in home economics, but is open to any one desiring information regarding simple methods of plant culture. Laboratory fee, $2.

12. **Investigation in Floriculture.** Credit one, two, or three hours. Prerequisite courses 1, 3, and 4, and permission to register. Designed primarily for upperclassmen and graduate students. Consultation by appointment. Professor Beal and Assistant Professor Lumsden.

The investigation of problems in growing flowers for cutting, exotics, garden flowers, and the like.

FORESTRY

The first ten weeks of the summer term will be spent at Ithaca; the remainder of the term will be spent chiefly in a study of logging and milling operations in northern New York and in practice work in mensuration and silviculture.

The following courses of instruction will be offered:

Group A		
	Forestry 9	Forest Utilization
	Forestry 11	Forest Mensuration
	Forestry 14	Silviculture: Forest Ecology
	Forestry 15	Silviculture: Natural Reproduction and Care of the Forest
Group B		
	Forestry 20	Forest Management: (a) Forest Organization
	Forestry 22	Seminary
	Forestry 23	Advanced Work
	Forestry 24	Research

For the professional forestry students, the courses in Group A will constitute the first term's work of the senior year. During the following term, these students are expected to obtain the required practical experience, returning to Ithaca to complete undergraduate work in the second term. Courses in Group B are offered for graduate students.

Courses 9, 11, 14, 15, and 20 are given for professional forestry students during the third, or summer, term only, because of the obvious advantages of the season and place of work.

Students should provide their own bedding and blankets for the trip, the expenses for which, including travel and subsistence, are estimated at from $60 to $75.

In the following program, the designated hours and rooms apply to work in Ithaca. A special field schedule is to be arranged.

9. **Forest Utilization.** Credit four hours. Lectures, M W F, 11. Forestry Building 126. Practice in logging camps and in mills the latter part of term. Assistant Professor BENTLEY.

Logging methods and equipment; logging in representative regions; manufacture of lumber; determination of stumpage values; timber sale contracts; timber sale administration, including marking, brush disposal, and scaling in practice; minor industries; the organization of the lumber industry; markets.

11. **Forest Mensuration.** Credit five hours. Lectures, M T W, 8. Forestry Building 126. Practice, M, 2–4.30. Forestry Building 118, and in special field work during the latter part of the term. Assistant Professor BENTLEY.

Measurement of logs and standing timber; timber cruising; study of the rate of growth of timber; volume and yield tables. Laboratory fee, $1.50.

14. **Silviculture: Forest Ecology.** First six weeks of term. Credit three hours. Open only to professional forestry students. Prerequisite course 13 and Botany 2 or its equivalent. Lectures, M T W Th F, 10. Forestry Building 122. Practice, W, 2–4.30, S, 8–1. Forestry Building 118. Professor SPRING.

The study of the forest as a society of trees; biological characteristics of trees and of stands in relation to the factors of site; influence of the forest on site; forest description. Laboratory fee, 50 cents.

15. **Silviculture: Natural Reproduction and Care of the Forest.** Beginning the seventh week of term. Credit three hours. Prerequisite courses 13 and 14. Lectures and practice to be arranged. Professor SPRING.

A technical discussion of the silvicultural methods of reproducing forests by natural seeding; the application of these in each of the forest regions of the United States; cleanings, improvement cuttings, and thinnings; marking timber. Laboratory fee, 50 cents.

20. **Forest Management: (a) Forest Organization.** Credit three hours. Open only to graduate students. Lectures, M W F, 9. Forestry Building 126. Professor SPRING.

Organizing a forest property for management. An important part of this course is a critical study of a working plan on a large forest tract in New York State; the course includes practice in forest engineering under direction of Assistant Professor BENTLEY, and field studies in forest administration.

22. **Seminary.** Credit two hours. Open only to graduate students. Hours to be arranged. Forestry Building 126. Professors HOSMER and SPRING, and Assistant Professor BENTLEY.

Field conferences on important phases of forestry.

23. **Advanced Work.** Credit two or more hours. Open to undergraduate and graduate students who have had the necessary training. Hours by appointment. Professors Hosmer and Spring, and Assistant Professor Bentley.

Individual advanced study of designated topics.

24. **Research.** Credit three or more hours. Open only to graduate students who have had the necessary training. Hours by appointment. Professors Hosmer and Spring, and Assistant Professor Bentley.

LANDSCAPE ART

13. **Plant Materials.** Credit six hours. Open to general election, but intended for regular students in landscape art. Prerequisite Botany 1. Lectures, M W, 8. Practice and field trips, M F, 10–12.30 and 2–4.30. Landscape Art Building. Professor Curtis.

A study of the characteristics and requirements of trees, shrubs, and vines for landscape planting, and a discussion of them as elements in landscape composition.

The work has been planned in consultation with the Departments of Drawing and Floriculture, so that a total registration of 16 hours may be made as follows: drawing 5 hours; floriculture, 5 hours; and landscape art, 6 hours. All of this instruction enters into the regular landscape art schedule and carries full term credit towards graduation. Laboratory fee, $1.50.

PLANT BREEDING

1. **Genetics.** Credit four hours or, by special arrangement, three hours. Prerequisite Botany 1 and 20 or equivalents in zoology by permission. Lectures, T Th, 8. Forestry Building 210. Laboratory, T, 2–4.30. Forestry Building 212. One conference period. Forestry Building 212. Assistant Professor Barker and Mr. Fraser.

A general introductory course and survey of the field of genetics, designed to acquaint the student with the laws of variation and heredity, their application to the improvement of plants and animals, and their bearing on eugenics. Laboratory studies in the collection and measurement of variations within certain species, in hybridization and selection, and in the laws of segregation and recombination. By special arrangement the course may be taken for three hours credit without the laboratory. Laboratory fee, $3.

PLANT PATHOLOGY

1. **Plant Pathology.** Credit one, three, or four hours. Prerequisite Botany 1 and 20 or equivalents. Lecture, credit one hour, Th, 10. Roberts Hall 292. Must accompany or follow recitations and practice. Recitation and laboratory practice, credit three hours. Recitation, F, 12. Agronomy Building 192. Laboratory practice, W F, 2–4.30. Bailey Hall, West Basement. Professor Whetzel and Assistant Professors Gregory and Hesler.

A fundamental course treating of the nature, cause, and control of plant diseases, illustrated by studies of the commoner diseases of cultivated crops. Laboratory fee, $4.50; breakage deposit, $3.

2. **Principles of Plant Disease Control.** Credit three hours. Prerequisite course 1. Recitation, Th, 12. Home Economics Building 100. Laboratory practice, Th, 2–4.30, S, 10.30–1. Bailey Hall, West Basement. Professor WHETZEL and Assistant Professors GREGORY and HESLER.

A consideration of the principles and the methods of control of plant diseases. This will include studies on: exclusion by laws, regulations, quarantine, and inspection; eradication by pruning, seed selection, tree surgery, rotation, disinfection, and other means; protection by spraying, dusting, and wound dressing, and the like; immunization by selection, breeding, and feeding. Laboratory fee, $4.50; breakage deposit, $3.

20. **Research.** Credit not less than three hours. Professors WHETZEL and REDDICK, and Assistant Professors STEWART, GREGORY, and HESLER. Laboratory fee, $1.50 a credit hour; breakage deposit, $3.

POMOLOGY

10. **Systematic Pomology.** Credit two hours. Prerequisite courses 1 and 8 and Botany 1. Lectures or recitations, T Th, 8. Roberts Hall 292. Several laboratory periods, S, 8–10.30, will be substituted for a corresponding number of lectures. Assistant Professor HEINICKE and Mr. ———.

A study of the botanical and physiological characteristics of all species of fruit-bearing plants, with special reference to their cultural requirements. The characteristic cultural methods of each fruit not discussed in a previous course are considered. Each student is required to collect and mount specimens of a number of varieties and species. Laboratory fee, $1.

13. **Pomology, Advanced Laboratory Course.** Credit one hour. Prerequisite courses 1, 8, 10, and 12, and permission to register. Hours and place to be arranged. Assistant Professor HEINICKE and Mr. ———.

This course is designed to give a more extended practice in the various nursery and orchard operations than can be given in course 1. It is intended for students doing their major work in pomology. Laboratory fee, $2.50.

19. **Research.** Credit one to three hours. Open to graduate or other students who have had courses 10, 12, and 13, Botany 1 and 20, Plant Pathology 1, Entomology 3, and Chemistry 1 and 30 or 32. Professor CHANDLER and Assistant Professor HEINICKE.

POULTRY HUSBANDRY

1. **Poultry Husbandry.** Credit three hours. Not offered to a class of less than ten students. Lectures, T Th, 11. Poultry Building 375. Practice, T, 2–4.30. Poultry Building 325. Messrs. HEUSER and ———.

An introductory and prerequisite course for students desiring to take specialized courses in poultry husbandry. Those desiring a general course should see courses 2a, 3, 3a, and 10. The course includes the anatomy and physiology of poultry, the study of the egg, embryology, nomenclature, bibliography, environmental conditions, the history and scope of poultry husbandry.

2a. **Flock and Plant Management.** Credit one hour. Must be preceded or accompanied by course 2 or 10 and preferably also by Animal Husbandry 1.

Practice periods and extra time arranged by appointment. Practice, three short periods a day, including Sunday, for four weeks: morning, 7.45–8.30; noon, 12.45–1.15; night, 4.30–5. Poultry Building. Messrs. Heuser and Andrews.

Record keeping, and management of fowls for egg production and for fattening, including preparation for market. Assigned reading and a written examination will be required.

3. **Incubator Practice.** Credit one hour. Must be preceded or accompanied by course 1a or 10. Practice periods and extra time arranged by appointment. Practice, three short periods a day, including Sunday, for four weeks: morning, 7.45–8.30; noon, 12.45–1.15; night, 4.30–5. Poultry Building. Messrs. ——— and ———.

Practice in operating incubators; testing eggs, keeping records, and taking apart and setting up machines. Assigned reading and a written examination will be required.

3a. **Brooder Practice.** Credit one hour. Must be preceded or accompanied by course 1a or 10. Practice period and extra time arranged by appointment. Practice, three short periods a day, including Sunday, for four weeks: morning, 7.45–8.30; noon, 12.45–1.15; night, 4.30–5. Poultry Building. Messrs. ——— and———.

The management of a brooder and a flock of chickens; the keeping of temperature, food, and growth records. Assigned reading and a written examination will be required.

7a. **Marketing Practice.** Credit one hour. Prerequisite course 7 and permission to register. Discussion hour, Th, 4.45–5.45. Poultry Building. Practice periods arranged by appointment. Poultry Building 100. Mr. Macomber.

This course is to accompany or supplement course 7 for those who desire additional instruction in the handling of poultry products and refrigeration machinery, and in general salesroom work.

10. **Farm Poultry.** Credit three hours. Not open to students who have taken any other course in poultry husbandry, except by special permission. Lectures, M W, 11. Poultry Building 375. Laboratory, W, 2–4.30. Poultry Building 300. Messrs. ——— and ———.

A brief course dealing with the practical application of the principles of poultry husbandry for persons who do not specialize in this subject.

12. **Research.** Credit one or more hours. Prerequisite course 8 and permission to register. Members of the departmental staff. Mr.———

An original investigation of a problem in poultry husbandry to be presented as a written thesis.

RURAL EDUCATION

2. **Principles of Teaching.** Credit four hours. Open to juniors and seniors who have completed course 1 or its equivalent. Lectures, M T Th F, 8. Caldwell Hall 143. Professor Stewart.

Topics considered: the application of principles of educational psychology and the philosophy of education to the problems of school practice; the nature of study and its principal factors; the teacher's relation to the learning process, motivation, psychological versus logical thinking, interest and attention, motor control; the problem and the project as basis for the organization of materials; the use of first-hand sensory materials; the selection and arrangement of subject matter; teaching methods, lecture, textbook, development, recitation; assignment of lessons, questioning, practice; and classroom management.

3. **Agriculture in the High School.** Credit three hours. Open to juniors and seniors who have completed courses 1 and 2 and who have met the farm practice requirements. Lectures, W S, 8. Laboratory, S, 9–11.30. Caldwell Hall 282. Professor WORKS.

A study of the purposes of vocational agriculture, organization and presentation of subject matter, textbooks, and home project and extension activities of the high school. A one-day excursion is a part of the course. Laboratory fee, $1.

10. **Principles of Method.** Credit three or four hours. Open only to graduate students who have had work in education. Lectures, M W F, 10. Caldwell Hall 282. Professor STEWART.

A detailed study of the principles underlying method with special reference to the teaching of vocational agriculture and home economics. Topics considered: the aims of education; education as essentially a dynamic process, illustrated in growth changes, heredity expressions, habit formation, play and manual activities, and in the expenditure of energy; the laws of learning, particularly those related to the organization of ideas; the function and structure of subject matter; the principles underlying various school practices, for instance the project; interest in relation to learning; the basis for the organization of knowledge; the tests of teaching methods; how we think.

20. **Administration and Supervision of Agricultural Education.** Credit two or three hours. Lectures, T Th, 10. Caldwell Hall 282. Professor WORKS.

This course treats: administrative phases of agricultural education of secondary and college grade; Federal acts relating to agricultural education; comparative study of types of schools of agriculture; state systems of supervision. Visits to schools in New York and adjacent States are a required part of the course.

RURAL ENGINEERING

3. **Farm Mechanics.** Credit three hours. Lectures, T Th, 9. Caldwell Hall 100. Laboratory, W, 2–5. Professor H. W. RILEY.

A brief course intended for the general student who does not wish to devote to the study of machinery as much time as is required for courses 1 and 2. The main purpose of the instruction is to develop ability to think and to reason in terms of mechanical devices, the machines used for this purpose being plows, mowers, binders, pumps, water-supply systems, spray machinery, and internal combustion engines. Laboratory fee, $2.

19. **Research in Farm Mechanics.** Credit one or more hours. Prerequisite adequate ability and training for the work proposed and permission to register. Professor H. W. RILEY.

Special work in farm mechanics on problems under investigation by the Department or of special interest to the student, provided, in the latter case, that adequate facilities can be obtained.

20. **Farm Engineering.** Credit three hours. Prerequisite plane geometry. Students are urged to take Drawing 1 in preparation for this course. Lectures, T F, 10. Caldwell Hall 143. Practice, W, 2–5. Caldwell Hall 400. Mr. Strahan.

A study of the practical solution of the elementary problems involved in connection with surveying and mapping the farm. Leveling for farm drainage, laying out building foundations and water supply. From the data obtained in the field a contour map will be drawn of one of the fields near the College. Farm sanitation and sewage disposal. Attention is also given to concrete construction, the design of simple concrete structures and estimates of their cost. Laboratory fee, $2.

30. **Farm Structures.** Credit three hours. Prerequisite Drawing 1 or its equivalent. Lecture, T, 12. Caldwell Hall 143. Drafting periods, two by appointment. Caldwell Hall 400. Mr. Strahan.

A study of the principles of design, including lighting, ventilation, sanitation, equipment, floor spacing, and construction, for barns, stables, and other farm buildings, and their application in practice. Laboratory fee, $1.

VEGETABLE GARDENING

2. **Commercial Vegetable Gardening.** Credit four hours. Not given unless five or more students register. Prerequisite course 1 and Botany 1; must be preceded or accompanied by Soils 1. Lectures, M W F, 11. Poultry Building 325. Practice, T, 2–4.30. Poultry Building 350, vegetable greenhouses, and gardens. Assistant Professor Kirkpatrick.

The principles of vegetable growing as applied in commercial production: choice of location, equipment, management, culture, special requirements, varieties, enemies, marketing, and profits. The laboratory work includes exercises in growing plants under glass, and in the planting and care of early outdoor vegetables. Each student assumes full charge of his own plantings, carrying them through to the end of the term. A one-day trip to visit market gardens is required near the end of the term. Cost about $5. Laboratory fee, $2.

3. **Commercial Vegetable Gardening.** Credit three hours. Not given unless five or more students register. Prerequisite course 2, Botany 1, and Soils 1. Lecture, T, 8. Practice, T Th, 10–1. Poultry Building 325. Assistant Professor Kirkpatrick.

The lectures are devoted to principles of market garden crop production and management based on experimental evidence available. Two to three hours per week reference reading will be required aside from reports in connection with laboratory work. The laboratory work is a continuation of that started in course 2: practice in care, harvesting, and marketing of produce. Study will be made of records on truck farm and of market garden management. Short trips to neighboring market gardens and a two days' trip to one or more of the most important market garden centers in the State will be required. Cost $12 to $15. Exact date to be arranged. Laboratory fee, $2.

5. **Vegetable Crops.** Credit three hours. Prerequisite permission to register; must be preceded or accompanied by course 2. Lecture, T, 9. Poultry

Building 325. Laboratory, Th F, 2–4.30. Vegetable gardens at East Ithaca. Mr. Kenerson.

The lecture will deal with the botany, history, and origin of the vegetable crops, as well as types and varieties. Judging, scoring, and exhibition will be given in detail. Laboratories will consist of descriptive studies of the main varieties and practice in judging and exhibition. Laboratory fee, $2.

Correspondence concerning the publication of Cornell University should be addressed to the Secretary of Cornell University, Ithaca, New York.

This publication is issued at Ithaca, New York, monthly from July to November inclusive, and semi-monthly from December to June inclusive.

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The Annual Register (for the year 1917–18, published January 1, 1918), price 50 cents.
Book of Views, price 25 cents.
Directory of Faculty and Students, Second Term, 1917–18, price 10 cents, and the following informational publications, any one of which will be sent gratis and post-free on request. The date of the last edition of each is given after the title.
General Circular of Information for Prospective Students, December 15, 1917.
Announcement of the College of Arts and Sciences, March 15, 1917.
Announcement of Sibley College of Mechanical Engineering and the Mechanic Arts, February 1, 1918.
Announcement of the College of Civil Engineering, April 15, 1917.
Announcement of the College of Law, May 15, 1917.
Announcement of the College of Architecture, July 1, 1917.
Announcement of the New York State College of Agriculture, June 1, 1917.
Announcement of the Winter Courses in the College of Agriculture, June 15, 1917.
Announcement of the Summer Term in Agriculture, March 15, 1918.
Announcement of Instruction in Wild Life Conservation and Game Breeding, January 15, 1918.
Announcement of the New York State Veterinary College, May 1, 1917.
Announcement of the Graduate School, February 15, 1917.
Announcement of the Summer Session, March 1, 1918.
Annual Report of the President, September 1, 1917.
Pamphlet on prizes, August 1, 1917.
Samples of entrance and scholarship examination papers, December 1, 1917.

Announcement of the Medical College may be procured by writing to the Cornell University Medical College, Ithaca, N. Y.

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